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GLEANINGS IN BEE CULTURE

A JOURNAL DEVOTED TO BEES AND HONEY AND HOME INTERESTS.

ILLUSTRATED SEMI-MONTHLY

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No. 8.



YOU ARE RIGHT, Mr. Editor; podophyllin is used in the cure of bee-paralysis because it is a purgative. It is obtained from the root of May apple, or mandrake.

FRIEND AIKIN, are you not a little extreme, p. 253? If "it is absurd to think of producing honey so that it must be sold by weight," it is an absurdity of which many of us are guilty; for would it not be more absurd to sell at the same price a section weighing 20 per cent more than another?

VIRGIN QUEENS are much harder to introduce than laying queens, *except* virgin queens just old enough to crawl out of the cell; these last are the easiest of all to introduce. [I cheerfully accept your correction. When I spoke of virgin queens I meant those that were four or five days old.—ED.]

A LADY asks how to start cuttings of roses. Take a slip of young growth, say one with a half-blown rose-bud at the end; take off the bud and cut into pieces two or three inches long; leave a leaf on each cutting; stick it in a saucer of sand kept *constantly* wet in a sunny window, or in a propagating-bed covered with glass.

THE TEMPERANCE people of Aurora, Ill., have conceived a unique plan to shut out saloons. They propose to raise \$35,000 (the amount of the licenses), to be turned into the city treasury if saloons are voted out in the spring of 1901. Of the \$35,000, \$10,000 are now in sight, and the saloon men are doing some thinking.

PROF. KIRCHNER reports in *Bienenpflege* that cross-fertilized fruits are larger and heavier than self-fertilized, although the difference in fruit is not so much as the difference in seeds. Self-fertilized pears show an inclination to ripen later than cross-fertilized, but this is not so marked in early sorts. In the main, Prof. K. repeats what Mr. Crane said in GLEANINGS, although the two accounts are independent of each other.

THE DAILY LOSS of bees in the cellar the past winter was just four times as much in the last 20 as in the first 100 days. [Right here I think we have a decided advantage in outdoor wintering. When there comes a nice warm day the bees, overcharged with fæces, can fly out and relieve themselves, and return to the hives. This, no doubt, saves a good many bees. The loss from outdoor wintering is greatest during the cold snaps when the mercury plays around or below zero, accompanied by a high wind.—ED.]

INEXPERIENCED BEE-KEEPERS sometimes propose shutting their bees in the hive in spring, when flying out would be injurious, such proceeding being frowned upon by the veterans. Now, however, in *Deutsche Imker aus Boehmen* a temporary imprisonment of bees in spring is reported as having been successful with practical bee-keepers, a good-sized antechamber being provided into which the bees can go and the old ones die, the bees being furnished, if necessary, with water, and perhaps pollen.

A CORRESPONDENT asks, "What is the best hardy ever-blooming rose?" I don't know. The three I named on p. 249 contain perhaps the best one each of the three colors among remontants. Strictly speaking they are not ever-blooming. To get hardiness and successive blooms, try the polyanthas, say Clothilde Soupert. There's a whole lot classed as hardy ever-blooming; but when you come to try them you will find either that they need careful protection to coax them through the winter, or that they will be weeks at a time without a bloom.

STENOG will, I think, agree with Editor Hutchinson about compensation for destruction of foul-broody hives after he has studied over it. The grip pension would not be parallel. If I take the grip I'm entitled to no pension; but if you kill me so other people will not catch the grip from me, you ought to pay my wife part of my value—if she thinks I have any value. If you destroy my foul-broody hives, it's mainly for the benefit of others, and they ought to be willing to pay for the benefit. They do in some other countries. [Quite right. But I referred only to the bees and not to the hives.—Sr.]

LE RUCHER BELGE reports honey sold to hospitals "a raison de 96 centimes le kilogr.," and the editor says the producer could not have had more than 66 centimes per kilogram, or 6 cents a pound. He thinks no country in the world could have produced pure honey at such a price. Friend Wathélet, it is not a thing to be proud of; but it is nevertheless a fact that in this country thousands upon thousands of pounds have been sold at a less price, and sometimes at half that—fine honey too. Honey is now higher than usual, and quotations in GLEANINGS run from 6 to 8 cents a pound for extracted, or 66 to 88 centimes le kilogram.

"NO COMB HONEY in the markets;" "we do not know where there is any to be had;" "comb honey can not now be bought in the open market for love nor money;" are expressions I find in GLEANINGS. But I see no advance in price. Why is that, with a bare market and a general advance in prices of other things? [If honey were a staple article like butter, then the price would jump clear up; but just as soon as it goes up, consumers go without it and say they will take something that is cheaper. Maple syrup usually comes on the markets about the first of March; and if comb honey is not pretty well cleaned up by that time it is liable to hang over until new honey is in, and then there is quite a sacrifice in price on the old.—ED.]

SPEAKING of bottom starters in sections, G. M. Doolittle says in *Progressive*, where full sheets of foundation are used "I do not see any need of bottom starters, and I never could see wherein enough foundation was saved between the full-sheet plan and the bottom-starter plan to pay for the extra work of putting in the bottom starters." Bro. Doolittle, I don't save *any* foundation by using bottom starters, and I've put in thousands of full sheets without them, but I'm not sure of having such sheets fastened to the bottom unless I put in so much there's danger of sagging. And I don't care how solid your section is nailed, the comb must be well fastened for shipping. [I had never supposed the use of bottom-starters saved foundation. My impression was that it was for the purpose of making the bottom attachment, which attachment is certainly very important.—ED.]

"WRITE your Senators and Representatives, urging them to support any national pure-food measure that may come before them," p. 269. If I am correct, *any* pure-food measure will not do, as at least one has been pushed that we do *not* want. Rev. E. T. Abbott says, in *American Bee Journal*, "Urge . . . the Brosius bill as revised by the last pure-food congress. Also urge them to be on their guard against any attempt to side-track this bill in the interest of one which is backed by only a few individuals." [The editorial from which you quote was written before I heard from Mr. Abbott, and I hope all bee-keepers will urge their Senators and Representatives to support *only* the Brosius bill; yet the opposition, doubtless, will put up quite a number of bills of this character, the purpose being to divide

the strength of the pure-food Senators and Representatives. That is just what the brewers did in our Ohio legislature. When they saw there was danger of our local-option bill passing, then other minor bills were pushed in to crowd in upon the calendar, and for the very purpose of inducing some weak-kneed members to accept these substitutes rather than the real measure that temperance people wanted. It is a very slick and easy way to defeat legislation; and it is therefore very important that the bee-keepers write their Representatives to support *only* the one bill, the Brosius, as revised by the pure-food congress.—ED.]



The drizzly rain, the swelling buds,
The song of birds on trees
All speak of spring's return at last,
And end of winter's freeze.

The Chicago *Record* of Feb. 17 published a long account of some honey-caves in Texas, near the Mexican line. I make the following clipping from it which seems to comprise nearly all of it that may be considered reliable:

There is enough honey in the brakes of Devil's River to make any man rich who will get it to market. There are tons of it; in clefts in the rocks, in hollow trees, in caves and in the famous "Devil's Punch-bowl," which is a great sink in the Devil Valley, and out of which bees swarm always in clouds so thick that at a distance of two or three miles it has the appearance of a great signal smoke. The hills and valley land along the river are covered for a great part of the year with an endless variety of flowers; and in the winter season, which is never cold enough to freeze the bees, there is an abundance of decaying fruit—cactus apples and berries of many kinds—so that they never have to stop working on account of lack of material or bad weather, and thus go on piling up their wealth throughout the whole year. The honey is of an excellent quality, of good flavor and color, and brings as good a price when brought to market as that made by tame bees.

The business of gathering this honey, while fairly profitable, is not followed to any great extent, for the reason that there is little in the work of the honey-hunter which is any thing like sport, and every thing connected with it is full of privation and danger. The country is so rough that it is impossible to get anywhere near the honey-caves unless one goes on foot, packing his camp equipage on his back or on a burro. Water is not overplentiful, and much of that to be found is unfit for use; and, besides all this, the actual getting of the honey is no easy task. Sometimes the caves are in such inaccessible places that the hunter has to let himself down the face of a cliff for two or three hundred feet, and hang there at the end of his rope while the bees sting him half to death, while he digs out a few pounds of honey; or, again, he may find a cave easy to rob, only to find that he must carry the spoil several miles on his back before he can get it to a place where he can load it upon his burros. But getting the honey is not all of the work. He must strain it and put it into cans, so that it can be packed out to the nearest trading-point.

The clipping was sent by the editor to the writer of the following letter, in order to get at the facts as nearly as possible:

Mr. E. R. Root:—As far as the story goes regarding the quantity of bees, caves, honey, etc., it was quite correct. The rough country in this border land is full of wild honey, and as good as the best ever made by

bees. This Devil's Sinkhole is a reality, situated in Edwards Co., about 75 miles northwest of here. The rest of the story, including the signal-smoke feature, is only the production of imagination, etc.

Del Rio, Texas, Mar. 23.

A. W. GILDEA.

The Devil's Sinkhole or Punch-bowl referred to is thus described :

When the party reached it, like every one else seeing it for the first time they were amazed at the proportions of the wonder ; a hole forty feet in diameter, yawning open in the middle of a wide valley, with a perfect torrent of bees rushing up from it like dirt blown from some mighty blast, and all the while a roaring as loud as that of a great cataract ; looking down into the abyss, for the hole widens immediately below the surface, they saw the festoons of honey hanging there which the bees had strung along the sides of their mammoth hive after they had filled the hidden grottoes, and looked in through the upward swarms and saw the gleams of combs built, no doubt, many years before.

The account of an attempt to get the honey from this sinkhole with the assistance of some Mexicans is interesting, but reads like an exaggerated account of what might have been based on some real incident. It is not likely that such clouds of bees could find subsistence in such a place year after year.



AMERICAN BEE JOURNAL.

On p. 122 of GLEANINGS the inquiry was made whether sulphur would enrage bees. Mr. P. W. Stahlman, of New York, says, "It does. We found by experience, that in killing bees with sulphur, now and then a few that escape seem to attack a person very readily ; also after having used brimstone in the smoker, and then filling it with fuel, it still has a decided brimstone odor, and bees hate it and show fight at once."



A correspondent in Albany Co., N. Y., has the following to say regarding black brood :

I never saw foul brood ; but from the description this so called black brood resembles foul brood very much ; it makes its appearance mostly in the unsealed larva, and at first it appears to show in the center of the white grub a small, yellowish dot on the larva, and finally this larva becomes yellow, some more so than others, and then it turns darker and darker, and at last is almost black, after which it dries down to an almost invisible object. It spreads as if by magic, and seems to be very contagious. As a rule it makes its appearance first among black and hybrid bees, the Italians almost always being the last to be affected. Sometimes in our yard a colony of Italians would be free from it, and in a flourishing condition, when surrounded by colonies rotten with the disease. Our bees were mostly destroyed to prevent its spread, and even water that we washed our hands in while working with the bees or honey was not allowed to be thrown where the bees could get it. In spite of all this, over 200 colonies have been destroyed, and many hives and fixtures have been ruined.



In describing the different kinds of people one meets in selling honey, Mr. S. A. Niver tells the following :

In a small grocery an old lady was the only occupant that I saw, so I asked her if she kept honey in stock for sale. She replied, "We do ;" while a loud voice from behind a pile of flour, in unmistakable Kilkenny accents, says, "I do." He had plenty of honey on hand—that nice clear "honey" in tumblers, with a piece of comb in it, which never granulates, and sells cheap—and he knew it was pure honey, for he went to his wholesaler and saw him take the honey right out of the combs, and if I would go I could see them do it every day in the year ! How does that strike you,

Mr. Editor? Extracting honey in a wholesale grocery house in February, thermometer down to zero ! But I accepted the gentleman's statement, and moved on, searching after more advertisers in the same line.

Here is some experience in another place :

Only last evening I overheard a clerk telling a lady customer that you could easily tell when comb honey was genuine—"by noticing the number of layers in the comb." (I just held my breath to catch the rest of it.) "But whether it is one or two layers that show it to be genuine honey, I have forgotten." Simply another case of "Good indigo will either sink or swim, and I don't know which."

It seems sad that the human race is as incapable of exercising reason in common affairs as ever. The most absurd idea instantly goes around the world, while the plainest matter of fact is not accepted—especially in medical matters. A friend of mine said last week at dinner that he read in a paper that we had no full moon in February ; and I doubt seriously whether I convinced him to the contrary or not. Perhaps his editor was "full" enough to make up what the moon lacked.

BEE-KEEPERS' EXCHANGES—WHY AND WHY NOT.

Read Before the California State Bee-Keepers' Association.

BY C. H. CLAYTON.

I was pained lately to read in a prominent bee-journal an article purporting to give the reasons "why bee-keepers' exchanges fail." The article in question was from the pen of a former member of this association, and was wholly unsatisfactory in that the writer not only failed utterly to grasp the logic of the situation, but also failed to point out any adequate remedy for the evils complained of.

In daily speech, modern men and women pay tribute to the old order—the order which seems to decree that the bee-keeper's existence depends upon brawn and not upon brain. This thoughtless slighting of the bee-keeper's vocation seems curious when one pauses to observe how deeply the bee-keeper of to day is involved in the meshes of commerce. The successful bee-keeper of this generation must be a business man first, and a keeper of bees afterward. In him must be combined many talents. He must be a capitalist, cautious and crafty ; he must be an operator of industrial affairs, daring and resourceful, and he must play labor's part with patience and humility. He is in business as certainly as the merchant or manufacturer. And until the order changes, the bee-keeper's success in business will be governed by the kind and quantity of brains he uses.

From the flower to the ripened nectar, from the first operation in bee-keeping to the last, one is forced to realize how the spirit of the age has made itself felt here. The most desirable bee-keeper is not the fellow who can hit the punching-bag most lustily. He is the man with the cunning brain who can get the most work out of the bees without injuring them for future use. He is in the ranks of skilled labor.

In the bee-farm the investor has the use of labor-saving machinery to increase the output of his establishment; his profits are large or small according to the caprices of his market. He can not estimate with much accuracy what his cost of production is going to be at any season. The rains, the winds, the drouth, may cut his product short fifty per cent or wipe it out altogether.

During the period of time extending back for the last ten years, the business community in the entire country has suffered from what seemed to have been over-production. The result of this was to bring about excessive competition in all lines of business. Anxious to find purchasers, prices have been cut below the limits of reasonable remuneration. This evil of excessive competition seemed to prevail everywhere. In the effort to obtain relief the wages of labor were reduced. This only led to additional complications. The workmen strove by the only means at their command to save themselves, and strikes and lock-outs were instituted, and these were followed by the usual distressful accompaniments.

The only effective means of overcoming this condition seemed to be in the obvious one of an undertaking among the producers of various lines as to the prices to be asked for their various commodities. Regulation in this respect was possible only through a union of interests upon the part of those engaged in the same line of business. Ordinary trade agreements were hard to enforce, and were readily disregarded in the effort to obtain business.

Only a small fraction of humanity can be stirred by considerations of moral or mental advantages. In our greedy modern life the material side is chiefly regarded. By far the greater number challenge all things with the question, "What is there in it for me?" It is but the statement of a simple fact to say that the present tendency toward combination and co-operation is but the reaction from the keen and excessive competition of the past few years.

Whether this movement for co-operation is justifiable or not, depends upon the facts in the case; and whether for good or evil must be determined by the results. An impulse so general and so widespread in the business world must have cause for its existence.

The rights of the public are not to be ignored in any event; but so long as those rights are respected, the individual is certainly at liberty to concentrate his capital and combine his resources with those of his fellows in the same line of business for their mutual benefit.

A practical instance of the good accomplished by co-operation is the decreased cost of production by doing away with the wasteful method of competitive business. By constant study of the conditions of business in all its phases they are enabled to increase the demand for a product, and thus enlarge the consumption. If abuses should arise, these organizations are at all times amenable to the law. No combination will ever be able to maintain abnormal prices, for the reason that such a course would call into play practical

competition, and this will always operate as a check. Any undue increase in price will lessen the demand.

The co-operative movement is the outgrowth of natural conditions, and opposition to it is based upon a misunderstanding of the fact that it is the application of a great and effectual remedy to the crushing and demoralizing condition which has resulted from unlicensed and excessive competition.

It is curious that we should have had growing up around us for the last three hundred years the very co-operative system of which philanthropists dream, and that men should have failed to recognize its features. If the day ever comes when all men shall have obtained a secure competency it will be when co-operation has become universal. There is no other road leading to the abolition of poverty.

Speaking generally, there will be no honesty in the world until men have been taught that all intersocial relations should be reciprocal, due to an interchange of service among equals. Any attempt to crush out or interfere with the proper and reasonable workings of this remedy is utterly hopeless. The movement is bound to continue until all industrial activities are brought into a system of co-operation.

Now a word concerning the opposition to the movement as experienced in the Bee-keepers' Exchange. I will name some of the reasons, as they occur to me, why the Exchange has found it difficult to attain that measure of success it deserves. I do not intend to be harsh, but I should be untrue to you if I were not plain.

The failure to perfect the organization, leaving out of consideration the failure of two crops in succession just as we were starting, is attributed to—

1. Selfishness on the part of many who desire to sell at the better terms offered by the great buyers on account of the agitation in favor of organizing. Such men say, "You are all right, but we have a crop of honey to sell, and are now negotiating to that end. *When we have sold* we will be with you, heart and soul, and do all we can to aid you in building up an exchange that will protect our interests. In the meantime, however, do not for the world abandon the effort to bring about a perfect and complete organization of the bee-keepers."

2. Crop mortgages, which prevent independent action on the part of the producers.

3. Concessions made to the producers in the way of rebate on commission, so much on supplies, or in any way that would be satisfactory to the parties interested. The inevitable result of such an arrangement is the lowering of prices to the producer by just that much, and it is a detriment to the honest buyer when he comes to deal with those who have not made this kind of deal. So the concession made to one operates to the detriment of all. Men are not in business for their health, and any thing of this kind is sure to be found out and taken advantage of.

4. Intimidation. Many have foolishly tied

themselves up, and are given to understand that siding with the movement might impair their personal interests.

5. Apathy on the part of some who do their thinking by proxy.

6. Jealousy on the part of some who fear that their neighbors may be as much, or possibly more, benefited through the Exchange than themselves.

7. Dissensions caused by differences of opinion as to how to proceed, and upon what plan the business shall be conducted. We have had our share of these, but, thank the Lord! I think they are a thing of the past. The school of adversity has taught us to look to results rather than mode or manner.

Our impressions of men and measures are too often superficial, being founded upon imperfect knowledge as to men, and meager experience as to measures. It seems to me to be humanly impossible for any one to arrive at a true solution of the problems involved in the workings of the exchange principle in the short period of one year, which length of time comprises the whole of our ex-president's experience in California. Others who have large interests here, and years of experience also, are not so ready to condemn the movement, even by implication, unless prepared to suggest something better. Too often we reach down into our minds and bring forth our thoughts, and put our brooding hypotheses into words, and show our acumen, and the searching quality of our discernment by shaping our conclusions and offering them to be examined. Talk of this kind does not consist of sworn statement. It is merely conversation, where fact is scarce, opinion abundant, and conjecture overflowing.

After years of study I declare to you that I see no other salvation except in some form of co-operation. You may call it a "combine," an "association," an "exchange," or a "trust," if you will, and try to legislate it out of existence.

Self-preservation is the first law of nature, and men must and will combine in furtherance of their mutual interests. Mistakes, many mistakes, have been, and doubtless many more will be made while seeking the best method of organization; but surely these mistakes should not discourage us, should not deter us from profiting by our past experience. There is no half-way place. We are fighting for our very existence, and we must be prepared to meet conditions as we find them.

These conditions are plain to all. Why, even the newsboys on the streets of this city to-day recognize them and are organized—associated together for the protection of their interests. Shall it be said that bee-keepers who, as a class, are among the most intelligent people in the world, can not or will not combine for the good of each other?

I feel deeply, earnestly in this matter. Three years now as secretary of the Exchange, I have been in close touch with the commercial world, and have had abundant opportunity to see the inside workings of affairs; and I tell you truly that, if you attempt to "go it alone," you will go as a lamb to the slaughter. You

will be the legitimate prey of every harpy that seeks to live off the sweat of honest toil.

Lang, Cal.

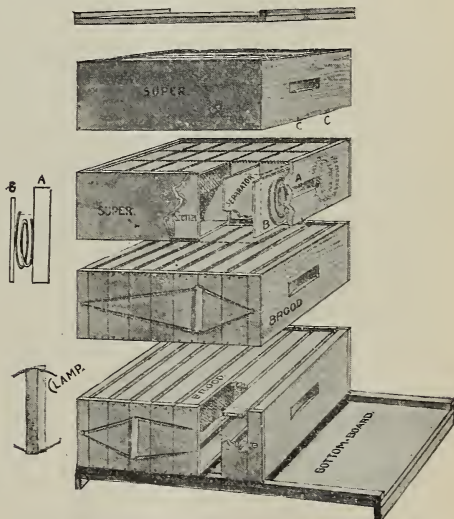
BINGHAM'S EXPANSIVE HIVE.

Its Special Features; How Constructed.

BY T. F. BINGHAM.

This is composed of 7 tight-end frames clamped or lashed together with a wire link or loop which is tightened by a stick which spreads the link, thereby shortening it so as to hold firmly the movable sides against the frames, rendering the whole practically a box which rests on a loose bottom-board having on either of its two edges a square strip $\frac{7}{8}$ inch by 24. These strips, it will be seen, leave an entrance the length of the sides of the hive. Above this hive is a clamp (or super) holding 18 one-pound sections.

That is all there is of the hive. If not large enough, any number of just such hives and clamps of sections may be set under or over it to suit conditions.



It is desirable to have a weather case or box to slip over the clamp of sections and hive; but it may be used without, with a wide board laid on top to keep off the rain and sun.

The 7 frames hold 20 lbs. of honey net, and the hive and honey and bees weigh 24 lbs.—so light that any lady can move it to any part of the apiary.

In the fall, when the season is over, all hives not required to hold honey for winter are taken away and stored. Two such hives are ample to accommodate any colony of bees from September till May.

A very small colony will breed up rapidly in such a hive at any breeding season, while in the spring they are a wonder and a surprise.

People who have never handled frames so lashed together can form no real conception of the ease and satisfaction in their manipulation.

The inventor of this hive does not say that it is better than any other, but that it is well adapted to meet the requirements of skillful bee-keepers, and will prove a great pleasure and a delight, if nothing more. In any apiary, with skillful management, more honey with less hard labor may be obtained from this hive than any other that I am familiar with. One such hive in sections or parts may not secure more honey than one large hive in one box; but an apiary of them will do so if cared for as it can be. This hive does away with the swarming problem by using all the bees to the best advantage. Every pound of honey a colony may gather above the brood-nest may be secured in the handsomest sections ever used, $3\frac{7}{8} \times 5$. As this hive can be reduced to any size, the smallest third swarm may breed up and be No. 1 for winter, while a second swarm may store surplus in sections. If one division of the hive is too large it can be reduced by using fewer frames.

As the bees are wintered in two hives, one above the other, it may transpire in spring that they would do better a while with but one. In such a case, only one would be used. Later on, when two or more of the brood-cases are full of brood and bees, but no honey in the fields, one of them may be set down beside the other one, or taken to some other part of the apiary and allowed to hatch its brood and get ready for the coming harvest.

The time is likely to come when such a hive in a poor locality may be the only means of getting nice honey in paying quantities. In the older States the forests have been cut away, and the wild flowers cultivated out. In such locations a special management is required, and an elastic hive needed.

The super or clamp shown is a T-tin one, with tight wooden separators $\frac{1}{8}$ inch thick. One of the separators is used as a follower, against which press two coiled wire springs holding the sections firmly, and using practically no room. On the side opposite the springs is a glass covered by a hinged door for easy examination. This enables one to watch the progress of work in the supers.

Farwell, Mich.

[At the Michigan State Bee-keepers' convention Mr. Bingham exhibited the hive which he had used for so many years, but upon which he had made some recent improvements; seeing which, our Mr. Calvert was quite favorably impressed with it, and he accordingly asked Mr. Bingham to send us a description of it and a hive. From the latter we have made an engraving, and the whole is produced above.

Knowing that Mr. Bingham was one of the pioneers—possibly the first man who used closed-end frames—I asked him for some of the particulars, and in response he sends one of his old catalogs, bearing the date of 1867. This shows his first hive—a hive that he patented in 1866. This had triangular frames, the end-bars of which were closed up part way, making what might be called a half-open and half-closed frame—virtually a Hoffman frame turned upside down. If you can imagine a Hoffman frame triangular in shape, with

half-closed ends meeting together at their ends instead of joining a bottom-bar, you will form a pretty good impression of the original Bingham frames. These were lashed or secured together by means of the wire loop, as shown above.

It was this frame and hive that was exhibited at the New York State fair held in Utica in 1866. Father Quinby, Mr. Bingham, writes was present at that fair, and came to see the new hive—the special features of which were explained to him at the time.

But Mr. B. soon discovered that such a frame, while it had some very nice features, was too large; and as the honey-extractor was just then being put on the market, he saw at once that the *shape* of the frame would have to be changed if it were to be adapted to that machine. Accordingly the end-bars were made parallel, and the whole frame changed to a shallow frame oblong in shape; but the uprights were made closed all the way up, making what would now be called a closed-end frame pure and simple.

In 1868 father Quinby introduced his closed-end frame and hive which is now used very largely in New York, with very little change.

I do not think there is any attempt or desire on the part of Mr. Bingham to deprive Mr. Quinby of the honor of inventing the closed-end frame as it is used to-day, but it would appear from what is given above that Mr. Bingham possibly gave Mr. Quinby the suggestion that led to the invention of something that is almost equal to the invention of Mr. Langstroth. Indeed, the closed-end principle is gaining advocates, and the time may come when closed-end frames will be the ones commonly used instead of open ends or partly closed, such as are now used.

If there are those living who are able to correct or throw a little light on this closed-end-frame question, I should be glad to hear from such.

The copy of catalog and booklet that Mr. Bingham issued in 1867 describes briefly the management of bees, and particularly his new hive, with half-closed ends. He writes that the Patent Office records of 1866 describe his hive more in detail.—ED.]

BLACK BROOD.

The Difference Between Spores and Germs; the Malignant Character of Black Brood.

BY DR. WM. R. HOWARD.

In correspondence with several of the leading bee-men of the country, to whom advanced proofs of my report on the New York bee-disease were submitted, questions on certain points of practical interest—longevity of spores, caging queens, disinfection, etc., have come up for further explanation and consideration. I now have these and many other points undergoing experiment, which can not be completed before spring.

SPORE-FORMATION.

Opinions not based upon facts demonstrat-

ed by actual experiments can be of no practical value; but a few general remarks upon spore-formation and its application to this disease will be of interest. *Bacillus milii* belongs to a form known as *endosporous*—spores

formed within the bacillus or germ. *Bacillus thoracis* belongs to the so-called *arthrosporous* form, in which the spore separates itself from the rod or germ by fission or transverse section, and does not form within as in *Bacillus*

Plate I.



THE CELEBRATED ALFALFA PLANT AND ROOT.

The plant represented in this plate grew in a rich, loose soil, with a heavy clay subsoil and an abundant supply of water, the water level ranging from 4 to 8 feet from the surface at different seasons of the year. The diameter of the top was 18 inches, and the number of stems 360. The plate shows how these crowns gather soil around them, for the length of the underground stems is seen to be several inches, and this represents the accumulation of nearly this much material about it.

This is one of the largest plants that I have yet found. The specimen, as photographed, was dug April 30th, 1896.—Dr. Headden, in *Bulletin No. 35, "Alfalfa."* See Editorials.

militi. In some species spore-formation takes place only when the pabulum is about to be exhausted, and remains at rest until a new nutritive medium is furnished, when they vegetate and again become *bacilli* or germs.

There are other species which form spores when the conditions are most favorable for a continued development. The spore-formation of the germs under consideration belongs to this latter class.



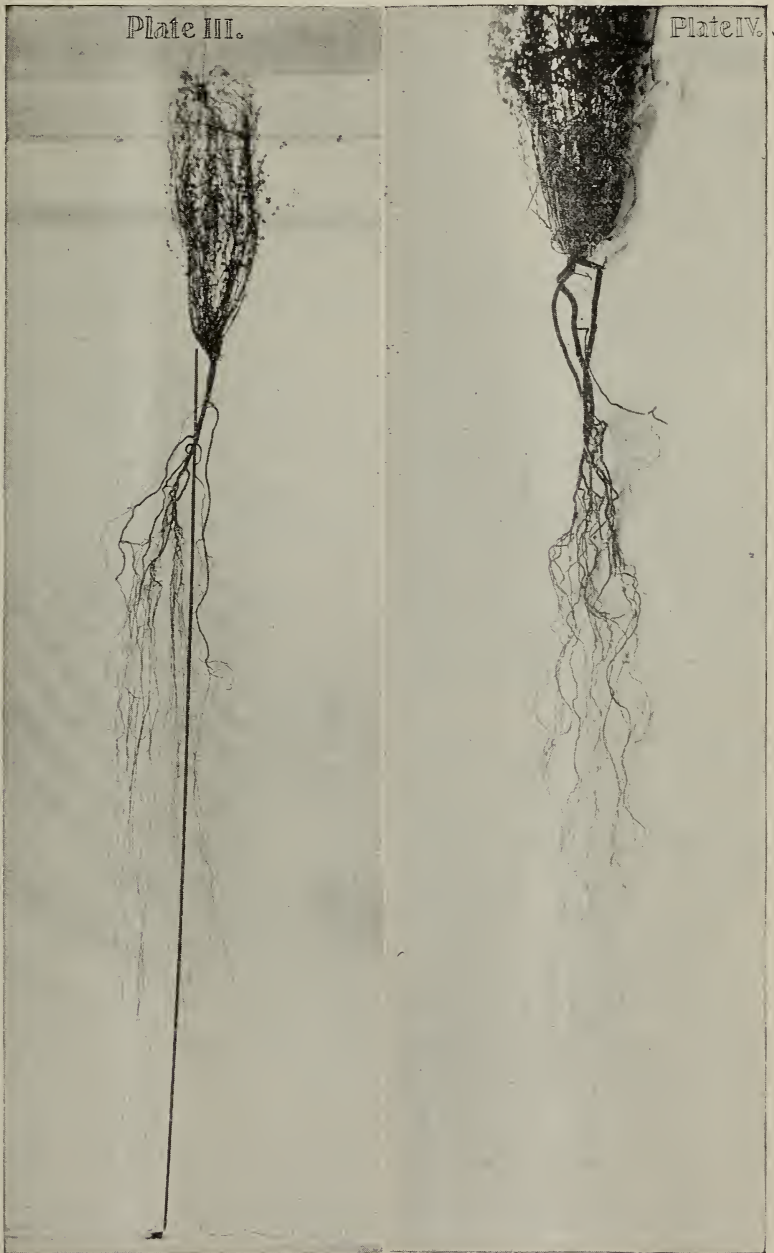
ALFALFA ROOTS OVER TWELVE FEET LONG.

This cut represents the face of an opening made to the depth of rather more than 13 feet in an alfalfa field on the Experiment Station Farm, at Rocky Ford, Otero County, Colorado. The soil is a fine alluvium. The roots penetrated to a depth of 12 feet 6 inches, and the simplicity of the root system is well shown, the roots being shown in their natural position. The upper margin of the photograph represents the surface of the ground, which lacks sufficient sharpness to show the crowns and stubble in the picture.

This alfalfa was four years old, and cut from four to five tons of hay per year. The diameter of these roots, just below the crown, averaged a little less than $\frac{1}{4}$ inch. See Editorials.

The relation of spores to germs is quite similar to that of seeds to plants. Spores possess a greater resisting power to drying, heat, chemicals, atmospheric changes, etc., than do

the germs themselves. Spores of *endosporous* bacteria are more resistant than those of the so-called *arthrosporous*; accordingly, spores of *Bacillus miltii* would have greater resisting



LARGE SPECIMENS OF ALFALFA ROOTS.

The two succeeding plates represent the largest alfalfa plants I have seen. The root system and the tap roots are exceedingly large; they were very nearly the same length—11 feet 9 inches—measuring from the crown of the root to the deepest point to which the roots had penetrated. They were not dug at the same time and are different types of roots. The tops of these plants measured over 5 feet 3 inches. They were obtained on the place of Mr. J. H. Walter, in Weld County, Colorado. See Editorials.

power than those of *Bacillus thoracis*, all other things being equal; but *Bacillus militi*, being *anaerobic*, growing better without oxygen or atmospheric air, the exposure of these germs or their spores to the atmosphere would possibly prove detrimental to their vitality. While *Bacillus thoracis* is *aerobic*—thrives better in the atmosphere, it would possibly resist atmospheric influences for a longer period. The spore formation of *Bacillus alvei*, the germ of foul brood, has been carefully studied, and, although *endosporous*, and retires to the spore or resting stage only when the food medium has lost its nutritive qualities, the spores lose their vitality in 24 to 36 hours when exposed to the atmosphere. [Author's *Foul Brood*, p. 21.]

Again, the larvæ and pupæ alone are attacked, and it has been shown that the disease does not spread through the atmosphere. [Author's *Foul Brood*, p. 12.]

When all of these points in the biological characters of the germs of *black brood* have been made plain we shall then have a definite knowledge of that with which we have to contend; for here is a disease in which it is strongly suspected that flying bees are affected; and of these, thousands daily leave their hives never to return, scattering the germs far and wide, to be borne by the strong winds, or wafted by the gentle zephyrs to new fields of infection. Much careful work yet remains to be done; but it will take time and constant attention to detail—many experiments, hundreds of cultures and trial cultures to be made, testing the powers of resistance to certain environments, before anything definite or reliable can be obtained.

CAGING QUEENS.

The impracticability of caging queens is fully appreciated; but the apparent necessity in our present light makes it worthy of trial. Bees are naturally restless and discouraged when the queen is caged. When in a starving condition, or affected with a disease which interferes with or disturbs brood-rearing, any condition which causes rapid depopulation produces a tendency to swarm out or leave their hive, and caging the queen augments this general uneasiness. More especially is this so in weak colonies during a dearth of honey in the field. During a good honey-flow this general disturbance is reduced to a minimum—first, because bees are encouraged by the new honey; and if strong in numbers there is less uneasiness attending the abnormal condition within; and, secondly, the dark masses containing the germs are usually covered up for the time being, and to a greater or less extent the disease disappears; consequently the bees do not seem so distressed. In connection with caging queens, feeding inside of the hive, in the evening, until the combs are well filled, will have a tendency to allay this uneasiness.

In treating foul brood and pickled brood, after making the stocks strong by uniting I have caged the queen and fed generously within the hive, and had fair success in holding the bees quiet until all danger was passed.

Another plan which dispenses with caging

queens, in a great measure safe and worthy of trial: In the modified McEvoy plan, instead of caging the queen, feed heavily within the hive the salicylated syrups* for at least ten days. All of the germs deposited for the first five days would fail to grow, and would be removed when the full sheets of foundation were given; and if these syrups were continued five or six days, or longer, there would be no immediate recurrence, and possibly a permanent cure.

DISINFECTION.

Boiling hives and fixtures for an hour in water would answer fairly well; but the temperature could not be raised to that of boiling oil or superheated steam. New York Foul-brood Inspector N. D. West's plan of holding a hive over a large gasoline torch or flame, would completely disinfect all surfaces reached by the flames. Moist heat is more destructive to germ life than dry heat.

In conclusion let me say that sufficient evidence has been presented to show that we have something new, and at present, apparently, more malignant and more destructive than the worst enemy hitherto known; but careful, practical, and experimental work in the presence of this disease when at its worst will, I feel confident, discover some practical plan for its successful eradication.

STARTING AN APIARY IN CUBA.

Some of the Drawbacks.

BY HARRY HOWE.

Having at last decided in a general way where the new apiary was to go I began to figure on what I will call the immediate location. Here again there was a wide choice; but when I began to try to rent the various pieces I found that there were but few that I could get at any price. Finally I went to a man who has some very large tracts of land, and tried to get on some corner of that. Instead of renting me the land he made me a proposition to go in partnership in the bee business. It seems that he had 2000 colonies in box hives before the war, and now he wanted to replace them with modern hives. After much discussion of details we fixed up some terms that we could both agree upon, and made out the papers. This gives me absolute control of nearly all of my bee-pasturage, for we can locate ten apiaries on the farm without crowding. As a matter of fact, I have located my first three apiaries along the good stone road on one side of the farm in order to have possession of those good locations which some one else might get by going on the other side of the road. The places back in the center of the 6600-acre tract can wait.

There are two other men in the same town who own large tracts of land, and who would like to make similar deals with some practical bee-man.

Along the stone road is a strip that is under

*Sodium salicylate one ounce, water five gallons, white sugar forty pounds. Make syrup without heat.

cultivation; but back of that, clear to the sea, eight miles south, are forests and swamps which make the finest bee-pasture. I had bought two small apiaries about ten miles from my new location, and this week I moved them over. They came for them with two large carts, each drawn by four oxen. The two wheels were six feet across, and were able to carry 10,000 pounds of sugar-cane, so the eighty colonies of bees with all of the fixtures, loose boards, etc., did not make much of a load for them. It took until midnight to get started, and then the drivers got lost, and wandered for miles over the very worst apology to the name of road one can imagine—pitch-holes three feet deep; stones as big as bushel boxes, and in one place a river ford—every thing bad imaginable, to say nothing of the loose bees. About the first jolt smashed one big box hive out flat, and the second opened the joints on several more on the load on which I rode.

Pretty soon the driver gave a war-whoop and a big jump which landed him out on the ox-yoke of the first team. There he rode the rest of the way while I sat on the back end of the tongue with a smoker, and kept the bees off the oxen.

The other loads were in American hives, and stayed tight except one which got a hole in the wire screen. But all things end; and just before sunrise we landed at the proposed location, and I began to unload alone. No one else would touch them. The bees were all over the outside of the hives and all over the cart. Now, to take 80 big colonies of bees out of a high cart, and carry them out and put them in place, takes some time, and is rather hard work for a man who has worked for the previous twenty-four hours, but it had to be done.

When the last entrance was open, and I had time to take account of stock, only two were completely done for. This was a great surprise to me.

I put all of the broken comb in one pail aside from the one that was completely smashed. I had a big pile of railroad iron to use for hive-stands, but no one to help put it in place; so after I had my dinner I got on my wheel and rode over to the next town, twenty miles, and hired an American friend to come back with me the next day. I now have this lot of 80 standing in pairs on the railroad iron, waiting for my sheds to be finished. The two other apiaries will be put in place in a few days. Then I shall go in to make my increase for the next season.

The present apiary is still waiting for a name. There is a pumping engine for irrigating, handy by, to use in cooking wax and making foundation. One of the other apiaries will also be near a pumping-plant. These private irrigating-plants are all over here. Generally they are worked by a horse or a yoke of oxen. The well near me is 10 feet across, and 180 deep. A six-horse-power boiler and a duplex pump brings up a lot of water, while the increased growth of the tobacco shows the value of it.

San Francisco de Paula, Mar. 19.

FOUNDATION IN SECTIONS.

Temperature in Cellars; a few Questions for Dr. Miller to Answer.

BY MORLEY PETTIT.

Dr. Miller's Stray Straws are always very interesting; and as I glance over them I am tempted to make comments.

First, I should like to ask the doctor which way he hangs foundation in sections. I have handled a great many sections which had foundation fitted as close as R. F. Holtermann describes, p. 924, but hung the "strong way," i. e., with corrugations vertical, and there was no buckling. The bottom starter makes twice the trouble, and should be avoided if possible.

That wet cloth, p. 6, for quieting the bees, is a capital idea, I should imagine. How about an entrance-guard? A little porch can be made of wire cloth and four pieces of lath; two end pieces of whole lath 3 in. long, and two strips of lath ripped in two, one against the hive and the other against the floor-board. We have enough to go over the whole apiary, and they are very convenient to lay on the entrance whenever hives are to be closed for a while.

In taking temperature readings in the cellar, where should the thermometer hang for best results when it registers 45° F.? Mine hangs about the center; and at 45° I consider the bees decidedly noisy. During some zero weather at New Year's day it got down to 38 to 40°, and they were almost absolutely quiet. The trouble this winter has been to keep the temperature low enough. I should like to hear the verdict of others on the temperature question.

Now, I should like to ask Mr. Doolittle what is the nature of his soil. It must be very light, for with our clay loam I could not conceive of his cellar being sweet without some sort of ventilator. His bees must be like Dr. Miller's, which so ungratefully desert the watering-trough during a honey-flow.

Belmont, Ont., Jan. 20.

[Dr. Miller replies:]

I have generally, if not always, hung foundation in sections running up and down the long way of the strips received from the manufacturers. I have had blind faith in them that they knew which way was best; and if the other way is better I hope they will change. Even suppose there is no buckling, I am wondering if there will be quite as good work done without a bottom starter. If so, I should certainly prefer to omit the bottom starter.

A proper entrance-guard that will quickly close and unclog a hive is a very desirable thing. I used them exactly as described until I found something I like better. The ones I now use are entirely of wire cloth, with a single stick to fasten them on the hive. They are made especially to suit the entrance when the bottom-board has the deep side up, making an entrance $12\frac{1}{2} \times 2$, but might be varied for any entrance. A piece of wire cloth $13\frac{1}{2} \times 4$ inches is doubled over at the bottom, and at each end $\frac{3}{4}$ inch or less (bending it over a

saw-blade), so that it will be just long enough to fit inside the $1\frac{1}{8}$ entrance. Then a piece of lath holds it with one or more nails. This gives all the ventilation needed for spring and fall hauling.

But the wet cloth is far and away ahead of a wire entrance-guard when it comes to shutting bees in the hive when carrying in the cellar. Shut bees in with wire, and they are more anxious than ever to get out, the excitement being mischievous. They shrink from the wet cloth, and conclude they *don't want* to get out; so the cloth can be taken away as soon as they are placed in the cellar, leaving them quiet. Ordinarily, however, there ought to be no necessity for fastening the bees in when carrying them in cellar.

Answering your question broadly, friend Pettit, I should say that it matters little in what part of the cellar the thermometer is hung, providing it is always hung in the same place. Mine hangs close by the door, because convenient. Neither do I think 33, 40, 45, or any other number of degrees the right place to set for every bee-cellar. The right temperature for *your* cellar with *your* thermometer is that temperature at which the bees remain most quiet, whether it be 40° or 50°; and that temperature is to be determined, not by any single observation, but by a number of observations at different times. There is no little variation in thermometers. I've stopped long enough to put seven thermometers together down cellar, and let them get settled, and they read as follows: 36, 42, 42, 42, 44, 44, 44. The first was a rather fancy affair, more for looks than for use. But I've seen a greater variation than that among a lot in a drugstore, all looking about alike.

C. C. MILLER.

Marengo, Ill.

MARKETING EXTRACTED HONEY.

Liquid vs. Candied; the Other Side Discussed.

BY CHALON FOWLS.

It's ludicrous to me, the way so many editors and correspondents are now running to embrace Mr. Aikin and his plan of selling his honey candied. I can imagine Root, Miller, and all the rest, shouting in chorus, "Oh! come to my arms, my dear fellow; your plan is just what I've always wanted; of course, I believe it will work; I've *always wanted to believe it.*" It is said he has succeeded, "grandly succeeded," as Dr. Miller puts it, but—succeeded in what? In disposing of his crop? Yes. But is the price remunerative? Ah! That's the *vital point* with me. This reminds me of an old story. A very learned though somewhat conceited man was being rowed across a swift-running stream in an old leaky boat. Oblivious to his danger, the learned man sat studying the heavens; but at last, noticing the boatman straining at the oars to get the boat across before it swamped, he said:

"Do you understand astronomy?"

"No," said he.

"Then," said the learned man, "one-fourth of your life is gone."

As this seemed to have little effect, and seeing the birds and fish, he said:

"Don't you understand any thing about zoology?"

"No," said he.

"Then," said the learned man, "half of your life is gone."

At this juncture the old boat struck a rock, and began to leak rapidly.

"Do you know how this rock came here? Do you understand geology?"

"No," said the man, taking off his coat.

"Then three-fourths of your life is gone."

"That may be," said the man; "but I am going to quit this sinking boat, and swim ashore. Can you swim?"

"No," said the man of learning.

"Then the *whole* of your life is gone," said he, as he struck out for the shore.

Now, supposing I have bees enough to gather enough honey, when sold at remunerative prices, to support my family, and the seasons are such that there is honey in the field to be gathered, and I am skillful enough in management to harvest a good well-ripened and fine-flavored article, and am still lacking in this *vital point*—an unable to get a fair price for it, all my skill and learning will profit me nothing. The great flood of adulterated honey, thin unripened honey, bad-flavored and dirty stuff, will overwhelm me, and I shall go down. In other words, I must get more than the price of sugar, and more than glucose mixtures, to make my living at the business. If I can't get more than the price of sugar I had better quit the business and go to raising beets and make sugar.

Now, I don't want to find fault with Mr. Aikin or his methods, for it may be the best that he can do in his locality, as his honey is alfalfa, and candies so quickly; but granting his plan to be the best in Colorado, it does not follow that it is best in the eastern part of the country, where we have different honeys.

I want to make an earnest protest against all this talk about classing honey with sugar and other sweets. I never let my customers work any of that heresy on to me. I say to them, "I am not selling you honey for sweetening; it's flavor I'm selling—the aroma of the flowers—and all you pay in excess of the price of sugar you are paying for flavor, just as you do when you buy maple syrup."

I suppose the advocates of selling in the candied state will claim that it is safer to ship, which I freely admit; but that does not apply when selling in one's own vicinity. They will claim that it is less work, which I am not so willing to admit. At any rate, the work comes at a time when I am not so busy, which I think will offset the little extra work entailed in sealing it up tight.

Dr. Miller speaks of gathering up honey from the groceries to remelt; but if the work was properly done the first time, there will be very little of this to do; at least that is my experience with clover and basswood honey.

I have just been to examine my stock that has been taken back, and find there is less than one per cent taken back within a year. The grocers often offer to melt up the small

amount that has become candied, but I always tell them I prefer to do that myself, as it is so easy to spoil it by overheating. And right here is a serious objection to the plan of giving the consumer his honey candied. A large proportion will be ruined by overheating; and it won't help the matter any to say it was their own fault, as the directions were on the can. After a customer has spoiled his honey he will be likely to try something else next time.

It may be said that the people should be educated to eat honey candied. I reply that candied honey is in an unnatural condition, and we should try to supply it to the people in as nearly the natural condition as stored by the bees as may be practicable; and the most feasible way is to seal it up tight in the liquid state; and the liquefying should be done by an expert, as the danger-point is at a lower temperature with some honeys than with others.

If I were to peddle from house to house I think I could sell candied honey; but I have about given up this kind of work. For various reasons it is more satisfactory to sell to the grocers; and for purposes of display, candied honey is "not in it" at all. Most people buy honey because it looks tempting—yes, twice as much will be sold when put up right and in plain sight.

"Out of sight out of mind" fits the case exactly. I asked one of our grocers if olives sold any better in glass cans than in tin, and he said, "Yes, they will take the glass bottles every time, even at a higher price." People don't like to buy a cat in a bag.

In conclusion I wish to call attention to what Wm. A. Selsler is doing. He liquefies and bottles his honey, and grocers are selling it at 15 and 25 cts. for half-pound and pound bottles, and his trade now reaches 40,000 pounds a year.

Gentle reader, consider these prices. For my part I find them very interesting and inspiring; and then, go thou and do likewise.

Oberlin, O.

[Say, friend Fowls, if you will take a trip through Colorado, and study the markets and their conditions, you may have occasion to change your mind. What may answer for you and your market might not answer for them. This whole question is a good deal a matter of education and locality. Why, there are many who eat the candied comb honey as they would so much candied confectionery, and they prefer it.

Your position is exactly right for you and Oberlin; and in saying that, I wish to draw attention to the fact that white-clover honey under the same conditions will remain liquid much longer than alfalfa. If you had such honey to deal with, you possibly would find, inside of six months, fifty per cent of your honey to take back and reliquefy.

Referring to candied honey you say a large proportion will be ruined by overheating because the average consumer does not know how to handle it. Are you *sure* of that? No danger of overheating unless he or she puts the can right on the stove; and most people

would stop long enough to read the label wherein it is directed to put the can into hot water.

There is no doubt you could do a better job—that is, make the cans present a prettier appearance, for you know just how to pour the honey, how to seal it, and how to relabel, when that is necessary; whereas an awkward bungling grocer might make a bad mess of it. —Ed.]

CANDIED COMB HONEY.

How to Save Both Comb and Honey.

BY M. M. BALDRIDGE.

A bee-keeper says, on page 88, that he has some frames of honey in which about one-fourth of the cells are filled full, or nearly full, of candied honey. He says he has tried a number of plans to remove the honey and save the combs, but thus far has failed to do so. The editor replies that the best use to make of such combs that he knows of is to put them into the solar wax-extractor next summer and melt them up; but that, if there is another and better way of treating them, he would be glad to know it.

Now, my plan of treating such combs is to uncap the sealed cells and extract the liquid honey, if any, and then fill the empty cells full, or partly full, of water. I then set one or more of the prepared frames of honey in an empty hive, and under or over a strong colony of bees. Sometimes I remove one or two combs from the brood-chamber, and replace with the frames of candied honey prepared as stated, with water. Any of these plans will do. The bees will then liquefy the candied honey and remove it from the combs, and with no loss of honey whatever, nor damage to the combs.

A good way to fill the cells with water is to lay each comb flat side down in a clean wash-boiler, and pour the water over all the cells with a dipper or a tea-kettle, from the height of a foot or so. Then turn the comb over and fill the other side with water. Now rest the comb in the boiler right side up for a few minutes, and let the water drip. The comb is now ready to give to the bees. The plan given is both simple and practical, and no one need lose a drop of honey, nor worry hereafter over combs of candied honey.

One spring I treated more than 100 frames of basswood honey, candied nearly solid, as stated, and with no loss whatever. In fact, for several years past I have had each spring a number of combs I have been compelled to treat as stated, with water. It is, of course, some trouble to do so; but I find that it pays, for I can then "kill two birds with one stone." It not only saves without loss both comb and honey, but at the same time it gives my bees water to nurse the brood.

I find sometimes that more than one treatment is necessary to enable the bees to liquefy all the candied honey. This depends, of course, on how many empty cells there may be to hold the water. In that event I repeat

the treatment once or twice. But the second treatment is generally sufficient.
St. Charles, Ill.

SHOP-TALKS.

Improvement in Stock.

BY UNCLE LISHA.

"Good morning, Mr. Simpson."

"A jolly good morning to you. How are you?"

"Pretty well," said I. "What are you up to nowadays?"

"Why, bless your soul, I am building me a new patent stall for my colt?"

"Something new, isn't it?" said I.

"Yes," said my neighbor Simpson, with his round full face all aglow. "You see one of them 'ere agents came along selling rights,

"Begorra! Is that so? I wish I could get hold of one of them 'ere kind of hives, and I would keep bees too. What great heads them patent folks have on them—ha!"

"It may be so," I remarked; "but some of us bee-keepers think it is often more in the season or the management or breed of bees than in the hive."

"I declare!" said Simpson, "there is a good deal to learn about this bee-business, isn't there?"

"Of course, but I haven't told you much yet. There is Hutchinson, who has been advertising queens reared from a queen worth a hundred dollars."

"What! a queen-bee worth a hundred! a hundred dollars? a hundred dollars for just one leetle bee? Why! that would make her worth more than her weight in gold," said Simpson, his eyes beginning to stand out in wonder.



and I bought a right—cost only five dollars, and I can make as many as I want."

"What sort of a thing is it?" I inquired.

"Oh! it is a large square concern with a ventilating arrangement and a curious feed-box, and a peculiar floor, and a door for an entrance, with a new-fangled lock to keep out thieves. The agent said horses will do better in this stall than in any other stall ever made; and my woman, she says she thinks I will get a premium next fall on my colt if I keep it in this stall."

"I see," said I. "A great many bee-keepers have used patent hives to keep their bees in. I was looking over an old volume of the *Amer. Bee Journal* the other day, and a man some thirty years ago was telling how he had secured in his patent hive 125 lbs. of the whitest box honey, and a new swarm, as an average from each old colony, in one season."

"Yes," said I, "more than her weight in diamonds; but that isn't much. There is Wright, in Western New York, who has a queen he calls Sweetheart that he says he wouldn't sell for two hundred dollars. And there is Mr. McIntyre, away out in California, has a queen, I don't know what he asks for her; but if he could be persuaded to sell I presume it would not be less than three or four hundred dollars. I tell you, 'bugs have riz.'"

"Mighty man! Did you ever? I never heard the like o' that in all my born days! Why! what makes them worth so much?"

"It is just because their stock is so industrious, such good workers."

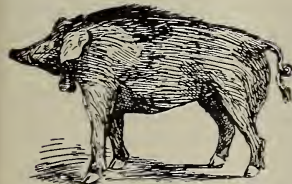
"Well done, now! I supposed all bees were just as industrious as they could be. I have heard my old dad say many a time, 'as busy as a bee,' and I didn't suppose one bee could be more busy than another."

"But for all that, they can," said I. "You see, all animals and plants vary from each other more or less when taken from their wild haunts and domesticated or cultivated. Then by selecting the best for many generations we can improve them. You see how we got our choice grapes which our grandfathers knew nothing about. Mr. Bull took some wild fox-grapes that were fit only for partridges or wild Indians to eat, and planted a lot of seeds in his garden, and then selected seeds from the best fruit and planted again, when, after a while, he raised the Concord, which he named after the town in which he lived. So by raising seedlings, and crossing with better varieties, we now have a good many choice grapes. Then there are our wild plums—but here comes Dan Savage. Good morning, Mr. Savage."

"Good morning. Bees making honey now days, I reckon?"

"Not much," said I. "I don't know how many times I have had that question asked me this winter. It is queer anybody should think of such a thing—as though bees could gather honey when there is not a plant in blossom out of doors within five hundred miles of here, and the snow is two feet deep, and the mercury 10° below zero. But then, you might teach me something about pigs."

"I reckon I could," said Savage. "I have raised enough on 'em; and there is money in the business, too, I reckon, with improved breeds. I can raise corn cheap on my flats, and then with clover and artichokes I am right in it, I reckon. But you want a good breed. There is the case-knife breed. I wouldn't give a cat's commission for the hull on 'em. Old Jenkins has 'em, and I reckon he will lose his farm. I'll bet it 'll go on a mortgage in less than a year."



CASE-KNIFE BREED.



WILD BOAR



YORKSHIRE PIG.

the wild boar and a Yorkshire pig. You see the difference, the grayhound pig and the Yorkshire pig. Both descended, doubtless, from

the same wild stock; but how different! The grayhound had to pick up its living as it could, and bred as it happened, while the Yorkshire pig has been well fed and housed and bred for many generations from carefully selected stock."

"I reckon that is so," said Savage, as he turned and shuffled down the street to look after his herd of squealing brutes, and my more agreeable neighbor Ben Bridgman walked into my shop with a cordial "Hello! how are you?"

"Pretty well. When did you get back from the city?"

"Came in on the morning train."

"Sell your wool?" I asked, for Ben is a wool-grower and a sheep-breeder as well, for about here both seem to go together. But before he had time to answer me I asked another question:

"See here," I said. "I have been wanting to see you for some time to ask you about your flock. You began keeping sheep, if my memory serves me right, some thirty-five years ago. What I wanted to know is, how much wool your flock averaged at that time, and how much now."

"During the civil war," he began, "the price of wool was high, and I increased my flock as fast as I could, and in 1865 I sheared just three hundred sheep, and they averaged me just five pounds of wool a head, which I sold for a dollar a pound. I don't keep so many sheep now—only about two hundred. Last year these averaged me ten pounds a head—just twice what I got thirty-four years ago."

"Good! I don't believe there are many beekeepers who can make as good a show as that in improving their stock."

I was going to make some more very complimentary remarks when Esquire Fullam came in.

"Good morning, 'squire. I notice by the papers you dairymen have been having a pretty lively convention over at B——."

"Well, that we did," said the 'squire. "You know our dairymen's association is the oldest one of its kind in the United States. We take our wives and daughters along with us, and put up at the best hotels, and have a jolly good time I assure you. Dairying is hard work, but it is honest, and we are all the time improving our stock and our farms—yes, and our children too. Ours is a grand State for dairying. We have the largest creamery in the world, and —— is the only town in the world that has the proud distinction of sprinkling its streets with buttermilk. I tell you I wouldn't swap our State for any other in the Union. Those York Staters may make more cheese, but I doubt if it is as good."

I noticed he was getting a little short of breath, and, at the risk of being rude, I interrupted him and said, "You spoke of improving your stock. Can you tell me how much you have improved it since your association was formed?"

"Well, let me see," he began. "Thirty years ago we got—that is, the best of us—two hundred pounds of butter to the cow, while now

some of us are getting three hundred, and a few have averaged nearly four hundred pounds. I tell you, ours is a great dairying State. We have the purest water in the world, and our high mountain pastures furnish the sweetest feed this side of the Alps; and with modern conveniences we can beat the world making butter, and"—

But just here he was taken with a fit of coughing, and I turned my attention to Will Simpson, who had been sitting on a pile of bran-sacks in mute astonishment.

"You see," said I, "improvement is the watchword with every profession nowadays; and if the bee-keepers don't improve their stock they will get left."

"Geewhittaker! I should say!" exclaimed Simpson. "But what is the use of wasting your time in trying to improve your bees when you can just as well keep bees enough to get all the honey there is, and they will board themselves and work for nothing, as I have heard folks say?"

"Just this," said I. "The flowers within range of my home yard give on an average yearly, say, 10,000 lbs. of honey. Now, if I keep the average run of bees it will take about 100 colonies to gather it, or 100 pounds of honey for each colony. Of this it will take about 70 pounds to keep each colony a year, leaving me only 30 pounds of surplus to the colony, or 3000 pounds from the whole yard. But if I keep stronger and more industrious bees, so that each colony would gather 140 pounds while the other was gathering 100 pounds, it would require but 71 colonies to gather the whole 10,000 lbs.; and as it would not require any more to keep each colony than it does the poorer stock, I should get 5000 lbs. of surplus instead of 3000 lbs. when I had to keep 100 colonies, to say nothing of the smaller number of colonies to care for, or hives to keep in repair. And what is true of my home yard is true to a greater or less extent of any other yards. See?"

"Great granthers and his great horned spoon! What ingenious fellows you bee-folks are! I wouldn't o' thought on it," said Simpson.

"Oh!" said I; "this isn't all, by a long way. Our supply of flowers is getting shorter as our forests are cut down; and unless we are able to gather the annual crop of honey more economically it will hardly pay to carry on the business in many sections; besides, we have got to improve our bees so they will gather the honey from red clover."

"Lawful sakes alive! you will make me go crazy talking about all them queer things. I didn't know there was so much to learn about bees."

A. S. H., Ark.—There is no trouble about keeping bees and chickens together; in fact, it is a common practice. Very small chickens, if the hencoop is placed near a hive of bees, may sometimes be attacked; but there is no use of putting such little chicks so near the hives. Large chickens the bees do not attack—at least it is very seldom that they do.



EARLY POLLEN AND HONEY.

"Good morning, Mr. Doolittle. It was such a nice morning, this last day of March, I thought I would call over and have a little chat about early bee-forage with you, for our pets will soon be out at work."

"Indeed, Bro. Jones, this is a nice morning, and I hope it may soon warm up enough for bees to have a good flight, at least, for, with the exception of the flight they had about the 10th of February, my bees, which are outdoors, have not had a chance to fly since November 10, 1899. I have often wondered how it is that our bees can stand four to five months of cold weather with only one flight, and sometimes none at all, much of which is from zero to twenty degrees below, while, if they have a few days of zero weather further south, we hear of a great loss of bees. But what was it you had on your mind regarding early forage for the bees?"

"Picking up a paper lately I saw an article regarding early pollen and honey, the writer claiming that such was that which laid the foundation for the bee-keeper's success during the season. This set me to wishing for knowledge regarding the plants and trees which gave this early pollen and honey. So I came over to see you. Can you tell the source from which bees gather pollen first?"

"The first plant producing pollen in this locality is what is known as skunk cabbage. The buds are all formed the season previous in a purple-colored sheath, about the size of a hen's egg; and upon the approach of spring this pushes through the ground, and a small opening is made by the sheath parting on one side so that the bee can crawl in."

"What! You don't mean those red-pointed things that we see standing up two or three inches high, sometimes four or five near each other, down in Smith's lot?"

"Yes, that is just what I mean. Those are the shells, as it were, and inside is a tiny ball about the size of a small marble, with little spikes covered with pollen standing out from it in all directions."

"But how do the bees gather the pollen? I thought they took wing in packing pollen in their pollen-baskets."

"The bees roll around in this shell and run over the ball, collecting the pollen in their baskets without taking wing, in much the same way they manipulate propolis from an old bee-hive which stands in the sun, till they secure a load, when out they crawl, often having more pollen on their backs than in their pollen-baskets, and away they go for home."

"That explains why my bees are covered all over with yellow dust in early spring, with very little pollen in their pollen-baskets, when they enter the hives. I had thought that they were so covered because they were 'novices' at the business on the start, while later on,

after they had learned their trade better, they packed it all snugly in their baskets. But do the bees get honey from skunk cabbage as well as pollen?"

"I saw somewhere, not long ago, the claim made that skunk cabbage produces honey, and one of our bee-papers said a few years ago that it had been several times mentioned as a honey-producing plant; but I think there must be a mistake somewhere, for, after a careful examination during many years, I have never been able to find a bee leaving this plant having any honey in its sac. My observation substantiates what Quinby wrote nearly half a century ago, when he said, in speaking of skunk cabbage, 'These afford only pollen.'"

"Does it grow on all kinds of land?"

"No. It grows only on moist to almost wet soils, or what is termed 'swampy places.'"

"How does it look later on in the season?"

"Soon after blossoming it puts out large cabbage-like leaves which, if broken, smell very much like the animal from which it derives its name."

"Does it blossom about the same time each year?"

"Its time of blossoming is from March 25th to April 20th, according to the earliness or lateness of the season, and is always eagerly sought after by the bees, as it is the first thing from a natural source which gives a chance for gathering."

"Is there nothing else which gives early pollen?"

"Yes, there are the pussy willows, but none of these blossom as early as does the skunk cabbage by about a week to ten days. There are several kinds of these willows which put out their blossoms quite irregularly. Some are a month earlier than others, and some of the buds on the same bush or small trees open nearly a week later than the first."

"How do the flowers look?"

"The flowers are of a rich orange color, and consist of a center out of which spring hundreds of little thread-like filaments, upon which the pollen is supported. It is very interesting to see the bees work on these flowers, as we can see their motions so plainly, for the tree or bush does not grow so high but that some of the lower limbs are about on a level with the eye. By having the bee between the light sky and yourself you can see its motions quite well, even while it is on the wing, as it simply hovers in the air while brushing the pollen into the baskets."

"Where does it grow?"

"Its natural home is about the same as the skunk cabbage; but with a little culture it will readily grow on dry or up land. They grow readily from cuttings put in the ground in early spring, as does all of the willow tribe."

"Does the pussy willow yield any honey?"

"Some claim that they do; but according to Quinby and my own observation they produce no honey. As they grow very plentifully about here I have had much observation regarding them, but never yet was able to find any bee at work on them having honey in its honey-sac."

"But is it not willow which gives the first honey?"

"Yes, but the willows giving honey are different from those giving pollen. The golden willow and the white willow are those which give us our first honey."

"But do not these yield pollen also?"

"Neither of these last-mentioned willows gives any pollen, so far as I can discover, for I never yet found a bee at work on them which had any pollen in its pollen-basket."

"Do the bees work on them much?"

"When these willows are in bloom and the weather is warm, the bees rush out of their hives at early dawn, and work on them all day long as eagerly as they do on clover, basswood, or buckwheat; and the blossoms secrete honey so profusely that it can many times be seen glistening in the morning sun by holding the blossoms between yourself and that orb, and the trees resound with the busy hum of bees from morning till night."

"Do the bees secure much honey to store in their hives?"

"Yes, when the weather is right they often store from ten to fifteen pounds from this source; but the great value of honey from willow lies in its giving honey so early in the season, thus stimulating the bees to early brood-rearing beyond any thing else that could be done. Where we have good weather during this bloom, and then during apple-bloom, our bees will always be in the best shape possible to take advantage of the flow of nectar coming from clover and basswood. Without these, the bees can not be in as good condition for the later flows, and that is why you read about early honey and pollen laying the foundation for success during the season."

"I think I understand now, and shall be more interested in these early-blossoming plants and trees than I ever have been before."



[Solicit questions for this department; but they must be put on separate slips of paper, and marked "GLEANINGS Department." If you desire an immediate answer, say so at the time of writing, and a private reply will be sent you in advance before your question with answer appears in these columns; but questions that are mixed up with business matters will not only be subject to considerable delay, but possibly will receive no answer at all.—EDITOR.]

MORE ABOUT W. L. PORTER, THE BEE-KEEPER OF COLORADO.

Dear Mr. Root:—I wish to thank you personally for the article in the March 15th issue of GLEANINGS regarding Mr. W. L. Porter, of Denver. Mr. Porter was one of my old students; and if there is any thing that makes a teacher's heart leap right up into his throat, and even turn summersaults, it is to hear good things of his old boys and girls. Mr. Porter was one of three brothers who came to the Michigan Agricultural College, and you have not told the best thing about Mr. P., which was equally characteristic of his brothers. I

refer to the fact of his excellent Christian character and great big conscience. All three of these boys—John, Will, and Albert—were earnest Christian young men, and never backward in any work which would please the Master. As we should expect, they were also earnest students. I will let Will speak for himself; but the other two, Albert and John, both of whom are now in the other world, were among the best students I ever had. I was glad to see the portraits you gave, and to know that Mr. Porter has such a delightful family. What you say of their hospitality and courtesy hardly need be said to any one who knows Mr. Porter. If there ever is a significant green tinge about my eyes it is when I hear of such visits as you must have had with the Porters in their Colorado home. Albert and John seemed strong boys in Michigan. They were certainly mentally and spiritually strong, and, as we all supposed, were robust physically; but both have gone on to the better world—like Lycidas, gone before their time. I think that, without doubt, had they gone to Colorado or Southern California, they might have remained to bless the world up to a ripe old age. I am very glad and thankful that Will went to Colorado. He was at our California convention a year ago, and aided us not a little in our deliberations.

Right here, Mr. Editor, I do not think you can too strongly urge any of your readers who are threatened with incipient lung trouble to hie away at once to either Southern California or Colorado. Such wise action almost insures restored health, useful work for long life, and blessing to the world. California is to day full of grand men, the like of whom I have rarely seen anywhere, who came here at the beck of such ill health. To-day they are in full strength and vigor, and are in almost all cases a rich blessing to their neighborhoods.

Claremont, Cal., Mar. 24. A. J. COOK.

GREASY SECTIONS.

Dr. Miller, on page 206, kindly asks why a colony of Punicus in his yard, working under the same conditions, made greasy sections all through the season, while other colonies made white ones. Now, I will be as frank as he often is, and admit that I don't know. I never had such a colony of bees, and would want them, or any other, under close observation to be able to say any thing worthy of consideration.

I do not pretend to know all about this matter of greasy sections, but have noted what has come under my observation, and intend to continue the investigation as thoroughly as circumstances may permit, so as to know, if possible, whether our good brethren of the bee-keeping fraternity, like our misguided ancestors, who honestly believed in witchcraft, have been committing a very serious offense or not.

I desire at this point, as questions are in order, and as very ripe, heavy honey invariably goes with greasy sections, to ask whether the queen should not have the credit for it. I'm one who believes that bees *manufacture*

honey instead of simply gathering nectar, as we are sometimes taught, and I am partial to a queen that produces a strong colony of bees which can *manufacture* thick *waxy* honey. To say that they simply gather nectar is as inaccurate as to say that the dairyman gathers butter and cheese, and it would be most gratifying to me to know just what part the queen plays in this whole business.

A superficial, indifferent observation determines nothing of value in any line of research or investigation; and those who care to get at the truth respecting this matter of greasy or watery capped honey should give the subject the most careful study possible. To this end I desire to say to any who have queens whose bees produce that kind of honey, if they will send such to me for experiment I will note all the conditions as carefully as I can, and report the results when the season is over.

W. M. WHITNEY.

Kankakee, Ill., March 28.

GREASY HONEY NOT DUE TO THE QUEEN; A CASE IN POINT ON THE OTHER SIDE.

Dr. McLean, page 170, has solved a problem that puzzled me greatly. The past season we had a considerable quantity of greasy honey, usually mixed with white sections in the same surplus; but one surplus attracted my special attention. The *outside* rows of the sections were capped beautifully white, while those on the *inside* were decidedly greasy. Now, I fail to see how any logic can be applied in this case to prove the queen or *strain* responsible for the grease. Both white and greasy were produced by the same bees, from the same queen, the same season, and in the same surplus-box. It must have been owing to different conditions of weather, as clearly set forth by Dr. McLean.

JOHN T. SILER.

Berkeley Springs, W. Va.

PARTIAL TO PLAIN SECTIONS.

I am very partial to the $4\frac{1}{4} \times 4\frac{1}{4} \times 1\frac{1}{2}$ plain sections and cleated fence separators. I am satisfied in my own mind that, by the use of the two together, the sections are more evenly filled, and present a neater appearance on the market by the side of the old-style beeway sections and tin separators.

Cincinnati, N. Y.

FLOYD SMITH.

ROACHES AND HOW TO GET RID OF THEM.

I should like to know what to do about the young roaches now in three hives I just bought.

MRS. ANNIE P. BENNETT.

Patoka, Ill.

[Will some subscriber who knows please answer?—ED.]

I prefer the ideal supers, holding 30 tall sections, to any other I ever used with fences. They are filled and sealed much nicer than the $4\frac{1}{4} \times 4\frac{1}{4}$, and sell more readily here.

HANS C. CLABERDEBOSH.

Syracuse, N. Y.



I WOULD call attention to a valuable article from M. M. Baldrige, in this issue, on how to treat extracting-combs filled with candied honey. Such an article is especially seasonable for this time of year.

I HAVE just returned from attending a convention of the Chicago Bee-keepers' Association—an organization that takes in bee-keepers of the city and immediate vicinity. The convention, while not large in attendance, was an excellent one, and the discussions were of the very best.

AFTER the convention I had a delightful visit with Dr. Miller and his family. In later issues I will tell you something about "go-backs." If you do not know what they are, I will leave you to guess until I can find a little more space to tell you about them. The Miller family are in possession of a valuable little kink which I believe the average bee-keeper does not know about, and which, too, I believe, will be worth hundreds of dollars.

HOW TO BLEACH POLLEN-STAINED SECTIONS ; PASTE THIS IN YOUR HAT.

JUST before returning home I hunted up Byron Walker's place, only to find that he was not in. As he had gone out with a load of honey he would not be back till late at night. But I met his man, Mr. R. S. Chapin, of Marion, Mich. He received me very courteously, and when I inquired in regard to Mr. Walker's method of bleaching he very kindly gave me the *modus operandi*.

"Quite accidentally," he explained, "Mr. Walker had placed in the show-window a case of sections, the faces of which were stained yellow. When he came to get them, some days afterward, he found they were bleached out almost white, and that portions of the sections shaded by the case were of the same yellow tint, showing that the sunlight had done the work. This accidental discovery led Mr. Walker to place more sections of the same sort in the window, with the result that these likewise were bleached as the first were."

"But," said I, "can you bleach travel-stained and greasy sections?"

"No," said Mr. Chapin. "Sunlight will have no effect on these whatever. The only sections that we can bleach are those that appear to be pollen-stained or have a yellowish coating over the cappings. These can be bleached so they will sell for No. 1 sections, provided, of course, they are No. 1 in all other respects."

"How long does it take to bleach?" I inquired.

"Anywhere from two to three days," he answered.

Mr. Walker had said that, when he got time, he would write up this matter, adding that sunlight was the agent used. As over a

year has elapsed, and he has not found the time, I take it from some things he has written that he will be glad to have me give the method.

This may be a little kink that will be worth hundreds of dollars, as it may save some sections that are otherwise fancy or No. 1 from being put into lower grades. A knowledge of how to make these darker sections fancy and No. 1 white, thus making them sell at the top of the market, may be worth hundreds of dollars to some bee-keepers. So I would advise, "Paste this in your hat."

THE GOOD WORK OF THE UNITED STATES BEE-KEEPERS' ASSOCIATION, NOW THE NA- TIONAL BEE-KEEPERS' ASSOCIATION.

IT will be remembered that the United States Bee-keepers' Association (now the National Bee-keepers' Association), by the advice and direction of General Manager Secor, assisted by Herman F. Moore and G. W. York, arrested in Chicago certain alleged sellers of glucosed honey for a violation of the Illinois pure-food law. While the suits resulted in the acquittal of the first defendant, it appeared then, and it appears much more so now, that the retail dealers in syrups and certain brands of so-called pure honey were scared all over the city. I learned with a great deal of pleasure that since the Association raised its hand to strike a blow, the amount of glucosed honey on the Chicago market has been cut down very materially, and that which is sold is pretty sure to be labeled "imitation." The newspapers at the time stated that the United States Bee-keepers' Association was back of these suits, and that it did not propose to give up the fight—that the guilty would surely be brought to justice. So, taking every thing into consideration, the effort resulted in a great victory for the Association, although it appeared to be at first a defeat.

I understand, also, that a new law will be in force in Illinois about the first of July, by which it will be the duty of certain food commissioners to make tours of inspection every so often to see whether adulterated goods are being sold in Chicago, and, if so, whether they are labeled "imitation." It appears that the sellers of these spurious goods are already scrambling to close out their "green goods." The suits that were already begun by the Association, and the enactment of the new law, are going a long way to wipe out adulteration in one of the worst centers of adulteration in the United States. Indeed, I should not be surprised if it would stamp it out entirely. In either event, no one will know just how much the Association has contributed to bring about this very desirable result. But that it has certainly done *something* can not be denied. I tell you, brethren, we ought to stand by the Association. Give it your dollars, because it is fighting *your* battles in a way that you can not do single-handed and alone, and I promise you there will be some later developments that will be an eye-opener if nothing else.

By the time the National meets in Chicago, in August, I hope there will not be a pound of adulterated goods to be had in the city.

WHY THE BEST HONEY IN THE WORLD DOES NOT PLEASE THE TASTE OF MANY CONSUMERS.

FROM some things that I pick up from the general correspondence in the office, and from other things that I learned while in attendance at the Chicago convention, it appears that alfalfa honey, which to the notion of many of us is the finest and most delicious in the world, does not sell readily in some of the Eastern markets. And why? Consumers say that it does not have *flavor* enough; that *real* honey has a strong honey taste. But this alfalfa, they think, because it is so mild, is nothing more nor less than sugar syrup, colored slightly, and flavored with some sort of extract. They want none of it, because if extracted or comb honey does not taste like the honey of their fathers, they jump to the conclusion that it is sugar syrup or glucose.

At one time honest bee-keepers and honest honey-salesmen had to contend with the so-called manufactured comb honey—something no one ever saw, but which, forsooth, the newspapers said existed; and now these same honest people are obliged to combat another bug-aboo or notion founded on ignorance—that all pure honey should taste exactly alike. Such a delusion is hard to dispel; but it should be met with the right kind of literature, and with the right kind of talking. There are years when there is little or no clover or basswood on the market, like last season, for instance; and the only high-grade honey is alfalfa; and to have this, the very finest honey in the world, called spurious, is most unfortunate.

Some honest salesmen, to satisfy the old craving, put into some of this nice alfalfa some strong flavored buckwheat or fall honey. But all such honeys, to me, taste like an inferior grade. Better put out each grade exactly for what it is; call it alfalfa clover if you will, but never put it under the name of "pure clover honey" in order to make a sale. While alfalfa is a clover, yet the term "pure clover," to the average customer, means neither more nor less than the old-fashioned white clover, which is indeed a very fine honey.

Let us call things by their right names, and go in for a general campaign of education. When white clover or basswood is not to be had, then individually explain to the consumers the fact, and that the alfalfa which we have to offer is pure bees' honey the same as that from clover and basswood. Whenever a salesman is known in any vicinity he will have very little difficulty in doing this.

ALFALFA, OR LUCERNE (MEDICAGO SATIVA).

THIS one of the clovers is very closely related to, and indeed greatly resembles, sweet clover, which latter is described under the head of CLOVER in our A B C book. Alfalfa has, during late years, come to be one of the most important honey-plants of the great West—especially of those arid regions that have to be irrigated. It is grown most extensively in Colorado, Wyoming, Arizona, Nevada, Utah, Kansas, Nebraska, New Mexico, Washington, Oregon, and is now making rapid strides in California.

It has been grown, in an experimental way, in many of the Eastern States; but outside of irrigated regions it is not known to yield any honey. While it makes an excellent forage plant in a few localities in the East, permitting of one or two cuttings, it is grown as a hay particularly in the Western States I have mentioned; for there is no other forage-plant that will yield the same tonnage per acre of fodder or hay in regions that have to be irrigated. It yields anywhere from 3 to 5 tons per acre, and gives from 3 to 5 cuttings to the season, and, under favorable circumstances, it is even claimed that 6 and 7 have been made. For the best hay, it should be cut when the blooming commences; but, unfortunately for the bee-keeper, this also cuts off the supply of nectar when it is flowing at its very best; for alfalfa, when in bloom in the irrigated regions, is perhaps the greatest honey-plant in the world. But notwithstanding the interests of the bee-keeper, the ranchers cut their alfalfa hay just as soon as it begins to bloom, irrespective of the fact that it is "killing the goose that lays the golden egg" for the bee-keeper. After cutting, it is stacked in the open field* in a stack that will run anywhere from 10 to 100 tons in capacity.

As one goes through the irrigated region of Colorado along the line of the Northwestern R. R., in a Pullman car going at the rate of 50 or 60 miles an hour, he sees hundreds and hundreds of such stacks; and where one stack has been cut into, or opened up, he sees not the dull grayish-brown hay of the East, but a beautiful grass-green clover hay; and it seems to keep green, no matter how old it is, provided it is not faded out by the intense sunlight that pours down with such relentless fury on the Great American Desert. But it is only the top layers that are faded. A few inches below, the hay is of the beautiful green color I have described.

The irrigation needed to grow it for forage makes the crop almost certain; and those bee-keepers who are located in the vicinity of alfalfa-growing can rely almost as certainly on a crop of honey, the very finest, richest, thickest in the world. Of all the honey I have ever tasted I know of nothing, not even clover (which has formerly held the first rank), that can equal it. It runs from 12 to 13 lbs. to the gallon, while most eastern honeys run from 11 to 12 lbs. This heaviness of body is due to the dryness of the atmosphere in which it grows; for where alfalfa flourishes at its best, hives made of the best seasoned white pine will shrink and twist and check in a manner that is truly astonishing to a "tenderfoot." A light dry atmosphere a mile above the level of the sea, in the regions of Denver, almost entirely devoid of dews and frosts, a cloudless sky, occasional hot winds, a bright sun that pours down, unobstructed by cloud or mist, causes every thing to dry up, and even honey to thicken—so much so that it is difficult to throw it out of the combs with the best of extractors. Indeed, I found that some bee-keep-

* In the irrigated regions it scarcely ever rains, and therefore great barns for the storage of the hay are not necessary.

ers are obliged to place their extractors in warm rooms, and even warm the combs sometimes before extracting, so thick is the honey. And then to do any thing like a good job of extracting, one must give the extractor-baskets a high rotative speed, and this necessarily puts a great strain on the wire cloth and the bracing of the extractor.

I have already spoken of the superb quality of alfalfa honey. If every one takes a liking to it as I have done, he will be almost spoiled for eating any other honey. Some of it is so thick and fine that it can be almost chewed like so much delicious wax candy. The flavor is a little like that of white clover, with a slight trace of mint that is very pleasant. In color it is quite equal to it, and in every other way it has no superior.

The nectar from alfalfa is secreted so abundantly during the time it is in bloom that anywhere from 100 to 500 colonies can be supported in a given location. In Colorado, however, it is found more profitable to have apiaries containing no more than from 100 to 150 colonies, owing to the very great overstocking in many of the best localities. Bee-keepers have rushed to this land of gold and golden honey in such numbers that in the great alfalfa-growing regions apiaries are stuck in very closely, from a half to a mile apart, so that it is not now profitable to have more than 100 colonies to the yard. In other localities not so much overstocked, from 200 to 300 colonies can be kept in a single apiary.

For a given acreage there is no plant or tree, unless it is basswood, that will support as many colonies. In several localities in Colorado, within a radius of five miles, there will be anywhere from two to seven thousand colonies, the like of which can not be found anywhere else in the world, probably.

There is scarcely a prettier sight than alfalfa when in bloom. The beautiful bluish or violet tinted flowers present a mass of color that is truly striking to one who has never seen the like of it before; and the fields are measured, not by the acre, but by the square mile. Indeed, I rode through one ranch in a Pullman car, going probably 50 miles an hour, that seemed all of 40 minutes in going through it—not acres, but miles and miles of it as far as the eye could reach on each side of the track; and stacks and stacks of it, aggregating 100 tons to the pile, more than one could count, if he were to try. Imagine, if you please, the effect of seeing such a field all in bloom, and mowing-machines going through it cutting it down. Imagine, too, the happy hum of the bees going to and from these immense fields. Then, truly, is the harvest of the rancher and the bee-keeper.

No time is lost. The rancher is eager to get the whole cut as *soon as possible*. The bee-keeper, on the other hand, hopes that his rancher co-laborer may make as *slow* work as possible; for as the mowing machines go through the field, the bee-keeper sees a gradual decrease in the flow of nectar. At the rate the mowers are progressing he can tell to a day when the hay will all be cut, and when the honey or the nectar will cease to flow. In

producing comb honey he supplies his colonies with just enough sections so the bees may fill every one of them at the close of the honey-flow which he knows in advance to a day. When the hay is all cut, then he awaits the new growth, the new bloom, and then, again, there is a scramble for honey on the part of the bee-keeper and the bees, and another scramble to get the hay down before it grows to be too old or out of bloom.

Fortunate is that bee-keeper who is located in the vicinity of those alfalfa-fields devoted to the growing of alfalfa *seed*; for all such have the benefit of the entire blooming until the flower fades and the seed-pod takes its place. It is in these regions especially that a large number of colonies per yard can be supported.

Most of the best alfalfa-fields in Colorado have been taken by bee-keepers; and unless one can take a range vacated by another by death or otherwise, or get it by purchase, it is a matter of common honor that the new comer should keep out, notwithstanding there are some who will squeeze in just a few colonies and gradually encroach upon the territory until there is not much in it for any one.

APPEARANCE OF THE ALFALFA.

To a tenderfoot, or one from the East, alfalfa looks a good deal like sweet clover; and when the two plants are young it takes even an expert to detect the difference; but as they grow older the alfalfa assumes more of a heavy bushy character; and the other, sweet clover, takes on more the appearance of a treelike weed.

CULTIVATION OF ALFALFA.

While it seems to grow best in the arid regions watered by irrigation-ditches, it also grows in localities where there is not too much rainfall or the soil is not too wet. It seems to do best on a light sandy soil with a loose or porous subsoil, and the roots run for 4 to 12 feet down—on the average perhaps 5 or 6 feet. The seed may be sown broadcast or in drills about 12 inches apart. The amount per acre varies greatly. Some think that 10 lbs. is sufficient, while others argue in favor of 30 lbs. The average amount seems to be from 15 to 20 lbs. If too small an amount of seed is sown, the plants grow large and coarse; whereas if a larger amount be used, a larger number of plants result in smaller stems and better hay.

Alfalfa is what is called a perennial—that is, it lives on from year to year, and the great difficulty of growing it in the East is to get it to make a stand. If it can be once started it will grow on from year to year with very little trouble.

The average life of the plants under ordinary conditions seems to be about twelve years, although some claim they will live as long as fifty years; but good authorities seem to doubt the statement.

For some of the data just given, and for the half-tone illustrations here shown, I am indebted to Bulletin No. 35, entitled "Alfalfa," from the State Agricultural College, Fort Collins, Col., by Dr. W. P. Headen, Chemist.



Blessed are the poor in spirit, for theirs is the kingdom of heaven.

Blessed are they that mourn, for they shall be comforted.

Blessed are the meek, for they shall inherit the earth.

Blessed are they which do hunger and thirst after righteousness, for they shall be filled.—MATT. 5:3-6.

In a recent sermon our good pastor in his line of talk used an expression something like this: "Jesus while here on earth never said, 'Thou shalt not drink intoxicating liquors;' neither did he say, 'Thou shalt remember the sabbath day to keep it holy.' But he did say, 'Thou shalt love thy neighbor as thyself.'" Jesus taught principles. I can readily imagine that, when he saw the scribes and Pharisees laying down laws that got to be innumerable, as to what man should *not* do, he became disgusted with that sort of worship, and therefore he swept it all aside, giving some general principles, and leaving man's good sense and judgment to decide for himself what he must not do.

After the sermon was over, and I had got to thinking of the matter, the question arose in my mind, "What did Jesus put strongest emphasis on? what did he say first in his ministry?" And then my mind dwelt on Sheldon's life work—what would Jesus do? If Jesus were present here just now, and should see the iniquity, intemperance, and crime on every hand, *how* would he remonstrate? what would he exhort men to do? Suppose great multitudes should gather to hear him speak. He would, without doubt, give some brief, practical general truths that would strike at the root of the whole matter, for no one ever lived who had the gift of putting as much in a few words as Jesus did.

Then the question arose in my mind, when he commenced his ministry and began giving general exhortations to humanity, what did he say first? Thank God, we have it. The beatitudes are so familiar to every man, woman, and child that I fear they have almost become meaningless. We read in the fifth chapter of Matthew, that, when he sat down before the multitudes on the side of the mountain, he opened his mouth and taught them, and here are the words. His first message was, "Blessed are the poor in spirit, for theirs is the kingdom of heaven." The next is much like it; and then he declares the meek shall inherit the earth, and that they which hunger and thirst after righteousness shall be filled. Dear friends, is it not possible this is what the world needs to-day? Is there any thing in the world the people of the United States need more than to beware of pride, arrogance, wealth, and all the injustice that follows along in the line of these things? I think I am really disturbed more just now than I ever have been before in my life, in regard to the state of affairs, not only in our own nation, but all nations. Things are different just now. The

people of the whole wide world are getting *in touch* as they never were before. Even the small children know what is going on in Africa, that far-away land that nobody knew much if any thing about when you and I were children. The United States has invaded a foreign land, and demanded that cruelty and oppression shall cease. We became very patriotic when this thing started. We began to point to the stars and stripes, and boasted that America was going to straighten up and *purify*—oh dear me! I am afraid that word "purify" was unfortunate; but after all, I think that is the way people talked and many of us felt. Uncle Samuel made some of those foreigners stop cock-fighting. I do not know but they were a good deal astonished when we declared it was *wicked*. Then Uncle Samuel wound up some other things that sounded big, when we were in the business of sending armed soldiers to relieve oppression. But we soon discovered—at least our *good* people did—that the average American soldier, even in military garb, was not a *bona-fide* missionary. I just saw it stated in the dailies that some military man had, within a few days back, declared no American soldier—that is, within his jurisdiction—should go into any saloon and drink, with his *regimentals* on. May the Lord be praised for this little glimpse of good sense and decency. But I am getting away from my text. You know about these things, even if I do not tell you of them all just now.

Jesus' first words were, "Blessed are the poor in spirit"—those who are not disposed to become cranky and important, even if you *put* them into office. There has been trouble in Manila and Porto Rico, and there has been trouble in Washington, because those in office have become proud, arrogant, and overbearing. I have sometimes pictured in my mind the attitude of Attorney-General Griggs when he told the temperance people what their temperance law *meant*. Then I have pictured again and again in my own mind the President of the United States when he talked with the women of the Women's Christian Temperance Union, and told them the Griggs decision had *got to stand*. I wonder if our President ever thinks of these beatitudes.

Well, our troubles are not all in the presidential mansion. Every large city is distressed and wearied because the chief of police, judges, and other officials become important and overbearing. But it is not the great cities alone where a hard, bad, and wicked spirit seems to have got in among public officials. I told you a few months ago with what enthusiasm our people in this county were working for good roads. During this good-roads movement the commissioners had quite a little to look after. They were responsible, not only for the way in which the money furnished by the tax-payers was used to build good roads, but, while our people were about it, it was deemed best to put in good substantial iron bridges. Well, the commissioners are now accused of using the people's money more freely than they have any legal right to do. In fact, it has transpired that neither the commissioners nor the other officers at the court-

house had any of them read the law, and really knew whether or not they were acting according to law, therefore our county is a good deal in debt, and there are rumors of crookedness. A committee is, however, at work, and we think it will all be straightened out. I am pretty well acquainted with most of the commissioners. Some of them I have known from childhood up. They have been mostly hard-working farmers—good, reliable, honest men—that is, they *used* to be, and I *hope* they are still; but if they ever believed in the little text at the head of this chapter, I am really afraid they have forgotten it. One thing about them troubled me—I mean about their behavior after they got to be commissioners. I have thought a good many times I would not say any thing about it, because it hits so many good people; but how can I hold up a word of warning unless I speak plainly and clearly?

I presume a good many think I make too much of *little* things, or that I *demand* too much of frail humanity; but I hope all these friends whom I may happen to hit in what I say will believe that I speak out with a kindly feeling in my heart, and without narrowness; for I am trying to love all humanity, even as Jesus loved the men and women of the whole wide world.

One day, when it was all bustle and hurry about good roads, I saw one of the commissioners, whom I had known for years, with a cigar in his mouth as he was giving directions. I was greatly astonished, for I had never even heard the man used tobacco before. He must have commenced after he was about sixty years of age. Soon after, another commissioner was put in to fill a vacancy like the first one, and he was a professing Christian besides. In a little time *he* had a cigar while he was riding about the county looking after things. I spoke of it to one old gray-headed veteran in the church—a particular friend of mine, and he replied something like this: "Mr. Root, I have watched this thing almost all my life; and our county commissioners all begin to use tobacco sooner or later when they get into office. I do not know of an exception, unless it is Bro. —. He *commenced* to smoke; but I went right to him, and protested so earnestly that he admitted I was right, and gave it up."

Now, some of you will say right here, and may be some of my very best friends, "Why, Mr. Root, you must let other men decide questionable matters like these themselves. You yourself enjoy the liberty of regulating your eating or drinking so as to suit your own notions. Are you not getting a little 'off' when you make a fuss about so small a matter as smoking a cigar when perhaps more than half the men you meet right and left use tobacco?"

Dear friends, I have thought of all this; and I would not mind so much about the cigar if I did not feel sure it was an indication of or a stepping-stone, if you choose, to something else. A man with a cigar in his mouth is more apt to be overbearing, and to tell people they know their own business than a man

who is not a smoker.* Our commissioners, as I have said, are good men—or at least they always have been. Well, nobody questions that they have filled our county with iron bridges when there was no money in the treasury to pay for them, and nobody knows where it is coming from to pay for them; and I believe it is agreed, too, that these bridges were bought from one company, instead of receiving bids from different firms, according to law. The tax-payers remonstrated with them; but the commissioners got a going, and told the tax-payers they knew their own business. Both parties have found out to their sorrow, however, that the commissioners did *not* know their own business. Now for our texts.

Jesus knew what was in humanity. He knew what sort of spirit prompts men to use stimulants, to be proud and overbearing because they were put in office, to become careless and indifferent to the best interests of the people who put them into office. Years ago a good business man (or so he was considered) was given an office in our court-house. Little by little he and his family began to wear fine clothes, and to ride around in a gay equipage. Finally their extravagance went to such great lengths people began to inquire and look into things. It was soon found that this man had been appropriating money belonging to the county, right and left. At first he charged the county for the fine equipage with which he and his wife went to a neighboring city on business for the county. As nobody made any objection he became bolder and bolder, and finally *kept no account at all*—used money as freely, almost, as if he were a millionaire. The poor hard working farmers who signed his bond had to make it good; and about the time the whole thing came out, this man died of apoplexy—perhaps caused by high living that the county paid for.

The Savior did not say, "Blessed are the poor in spirit, even if you put them into office;" but I think it was in his mind. He did —

* After the above was in print I read it over again, and it occurs to me that many good people who have used cigars all their lives (or pretty much all) may misunderstand me. Let me try again. Suppose a young man with Christian parents, or say a minister's son, who has all his life carefully avoided not only cigars but stimulants of every sort. Now suppose this young man all at once get into the tobacco habit; it indicates, at least in his case, that he is breaking away from his former habits, former teachings, and, I guess I may truthfully say, from his former associates. It means much more in his case, because a boy with such a training, when he gets started, goes down pretty fast. Well, the same thing is to a certain extent true with a middle-age man. If he has worked hard all his life, and kept clear of these things because of the expense of such habits, if nothing more, when he gets in with a new crowd, and starts to puff a cigar, it is usually the outward indication of a letting-down of principles within his heart. O my friends, you need not argue the case. When we have a candidate for office, and you can truthfully say, "Why, this man has the very best of habits; he never drinks, and does not even use tobacco in any form," the whole wide world admits that such a statement is in the man's favor. The very men who sell liquors and tobacco subscribe to what I have been saying. A young minister once provided himself with some cigars, and went out and mixed in with some of his congregation who were smoking in the horse-sheds at noon time. He expected to win their favor by showing that *he* could smoke *too*; but he was sadly disappointed. He actually *loved* himself in their estimation as well as in his own.

not say, "Blessed are the meek, even if they are exposed to great temptation, and have reason to think that nobody is looking after them nor watching them;" but I think it was implied. He did not say, "Blessed are they which do hunger and thirst after righteousness, no matter what inducement or bribes may be offered on every hand to turn them from the straight and narrow path;" but I think his talk included all this; and I do firmly believe that not only the people of this country, but the whole wide world, need *meek* and *lowly* and *humble* people more now than they need wealth, new discoveries, or any thing else. The great cry all the way from the county court-house to the capitol at Washington is for men and women who will not be "puffed up" if you give them an important office where great sums of money shall be intrusted to their care. We want marshals, policemen, judges, senators, who can not be swerved one hair's breadth from what they *know* to be their duty, by all the machinery and wealth belonging to the brewers and liquor-trusts. What the *whole world* needs is the spirit of Christ Jesus and his teachings in the hearts of all men. In that first sermon on the mount, the Master seemed to think it more important that he should warn us against pride, and against being puffed up by responsibility, more than any thing else. And is it not as true to-day as it was in olden times? Intemperance, crime, and all other sins and evils, would vanish if people *believed* the few words of these little simple beatitudes.

WHY DOES A YOUNG BEE DANCE WHEN IT GETS HOME WITH ITS FIRST LOAD OF POLLEN?

Dr. Miller and Ernest both gave their explanation on p. 251, April 1, but I think they miss the main point. The young bee dances about for just the same reason the little child dances out in the twilight. It is its way of showing its thanksgiving and praise and gratitude to the great Father above for having given it a place in this world of ours. The dog and the cat, and all domestic animals, have their special fashion of indicating that they are happy and grateful to the great God who gave them their life and being. I have watched these young bees for hours (just as I am watching flowers nowadays in the greenhouse), and I am sure I am not mistaken. Sometimes when they are tumbling about in this sort of fashion they get in the way of some of the old veterans. The ragged-winged workers do not seem to share in their enthusiasm, and probably do not see any thing to make such a fuss about. But this young bee has just had, may be, its first flight away out in the outside world. Just think of the contrast compared to the close hive where it has spent all its life. It has been out in the sunshine amid the flowers, perhaps buzzing from one soft-maple blossom to another. Why, it would be funny if it did *not* feel like dancing when it gets home with its load of luscious food so handsomely padded on each little thigh. To be sure, it is important news to in-

dicating; but, besides all that, I am sure it is its way of praising God for the wonders that even a *bee* can comprehend in this beautiful and wonderful world of ours.



SOMETHING FAVORING THE VEGETARIAN DIET, AND A LITTLE CONCESSION TO THE BATTLE CREEK PEOPLE.

Some of you may remember that I said some time ago I would give a thousand dollars for any sort of treatment or medicine that would enable me to eat fruits and vegetables as other people do, or as I did when a boy. Well, I have not yet reached that desideratum, but I am making progress along that line. Perhaps a year ago, in the *Good Health* magazine published at Battle Creek, Dr. Kellogg advised people who could not eat fruit, to try a meal of fruit only, eating nothing else whatever; and he declared that even a dyspeptic could assimilate the fruit under such circumstances. I first tried baked apples and bread and butter for breakfast. I got along very well, but it was not quite a success. I tried again, making my *entire* breakfast of baked apples—not even a crumb of bread. To my great surprise I felt very well indeed all the forenoon. I did not feel any more faint and used up at dinner time than usual—perhaps not as much. I tried the same thing with apple sauce, but it did not answer. Then I considered that the sauce was sweetened, and the baked apples were not. So Mrs. Root began making apple sauce especially for me, without any sugar; and for several months I have been rejoicing in a good dish of sauce three times a day. But I find I must not eat sugar or sweets of any kind if I want the apple sauce to "behave itself."

After many tests, my firm conviction is that sugar, or the excessive use of sugar, is at the bottom of most of the indigestion in our land. My good friend, if you are troubled with headaches or sour stomach, cut off sugar (especially sugar in tea and coffee) and see if you do not get the benefit.

Now I have something better yet to tell you. For years past, along in the afternoon, say three or four o'clock, I get exhausted, mentally and bodily, so that I am almost unfit for any thing; in fact, I have oftentimes counted the minutes until our five-o'clock supper time. A cup of malted milk refreshes and revives me, but I do not get really braced up until my evening meal. I have tried having my dinner of pure lean meat, and tried eating a larger quantity, so that my strength might hold out; but the larger quantity of food, I found, worked the other way. Some time in January, when we were gathering our first Grand Rapids lettuce, I decided to try a good dish of lettuce well moistened with good *cider vinegar*. To my surprise, it did not seem to disturb my

digestion. Soon after, I ate some more lettuce and vinegar, and took a dish of baked beans, and forgot all about it. When the whistle blew at five o'clock I was over in the greenhouse, and was greatly astonished, for I had not even thought of supper time—no headache, no faintness; in fact, I did not care particularly about *any* supper. Mrs. Root suggested it only *happened* so; so I tried baked beans and cider vinegar next day, eating no meat, mind you, and nothing with the beans but a little dry bread. I am more rejoiced than you can think, to tell you that there has been no failure. After a few days, with improved health I found my chills disappearing; and I got along very well without my overcoat, even when the weather was down to 20 or 25—no more sitting over the radiators or putting my feet in the oven.

I have avoided the use of vinegar for years, thinking it *produced* indigestion; but now I find that, taken with beans at least, it *aids* digestion. The weather is not yet suitable for riding a wheel; but when I take my next wheelrides I am going to carry along a lunch of baked beans and good cider vinegar. I recognize, dear friends, that what is one man's meat is another man's poison, but I have given this because I feel assured others may be greatly benefited by the suggestions I have thrown out. May the Lord be praised that I am daily gaining in strength without any animal food, for at least one meal during the day. The diet mentioned does not answer so well for the *last* meal of the day. It is a diet that needs exercise after it; therefore I am having beefsteak for my last meal, with a piece of dry bread.

In connection with this matter a valuable suggestion from one of our womenfolks in regard to preparing beans for food will be found interesting. We have tried it, and I, at least, am very much pleased with the plan.

Mr. A. I. Root.—Having had GLEANINGS in our family for years, and thereby learned that you believe in wholesome living, I have thought that you might be interested in a method I have originated of cooking dry beans which removes the skins and germs. No one seeing the tough skins which have been removed would want to eat beans again with the skins left on. By this method old beans cook as easily as fresh ones.

Pour one quart of beans into two quarts of boiling water on the stove; add two level tablespoonfuls of baking soda. Stir them so that all will heat alike, for about ten minutes, or until the skins are loosened enough to slip off easily when pressed between thumb and finger. Drain the soda water out through a colander, and put the beans into a dish-pan containing cold water. Rub them between the hands until the skins are removed from the beans. Then stir them up, and the skins, rising to the top, can be poured off before they settle. Add more water, and stir and pour off the skins several times till all are removed from the pan. The germs will settle to the bottom, and remain after the beans are dipped out. Then put the beans into 1½ quarts of water; salt to taste, and cook about an hour. If desired, meat can be cooked with them, though we omit the meat, and usually sift them through a colander when done. Add cream, and bake in oven, though this is not necessary.

Farina, Ill., Mar. 21. MRS. T. P. ANDREWS.

Mr. A. I. Root.—I have been quite interested in your talk on tobacco. I want to tell you that it is 21 years to-day since I quit using the vile weed. I used to smoke ¼ lb. every 24 hours. I will never backslide.

Dryden, Oregon, Mar. 22. JOHN MCKEON.

ROBBING SICK PEOPLE.

OXYGENOR KING, OXYDONOR, ELECTROPOISE, ETC.

Mr. A. I. Root.—As former editor and proprietor of the *Northwest Horticulturist*, I have frequently read and admired your GLEANINGS for its terse homely truthfulness, and am surprised to see any criticism emanate from you regarding Oxygenor or Oxydonor. I am an agent of the Oxygenor because I have seen with my own eyes cures effected by the instrument, and it seemed to me to be indeed a Godsend to the afflicted. In my own family, cures of neuralgic and catarrhal affections and inflammatory attacks have been made. I am now about well of an attack of lumbago, which was treated solely by this instrument. That it cures diseases there is no doubt. I shall never forget the first instrument I sold, an Oxydonor, to an aged gentleman of this city, for use by his son on the verge of death, given up by the physicians—in fact, a son who had for many years been dissipated and dissolute. The Christian father was anxious to keep the son alive until he could be induced to confess Christ. The doctors gave him 24 hours to live. The Oxydonor kept him alive 4 months, during which time he confessed Christ, and his aged father and mother, pleased beyond expression, died shortly after. The father, a personal friend of mine, said that the instrument had been beyond value to them in having thus prolonged the life of his son.

Here is another case of a party, as shown in the inclosed circular, who paid nearly \$5000 in treatment for stomach troubles, without a cure, and was cured in three months' treatment by a \$15 Oxygenor. Which was the fraud in this case—the Oxygenor or the physicians and druggists who had failed to do for nearly \$5000 what the Oxygenor accomplished at a cost of \$15? I doubt whether you have made a thorough investigation, or a practical one, to arrive at the decision you seem to hold. Have you referred to the U. S. Health Reports as per citation, and found the quotation not there?

W. H. BOOTHROYD.

Tacoma, Wash., Mar. 26.

Our friend, in his concluding sentence, refers to government indorsement, and I copy the following from the circular he incloses:

STRONG GOVERNMENT INDORSEMENT.

The Oxygenor is strongly indorsed by the United States Secret Service Bureau, on page 8, No. 8, Vol. XXIV, of United States Health Reports. With other statements are the following: "In this treatment will be found the only positive cure for all chronic diseases of men and women, such as nervous debility, female weakness, nervous prostration, loss of memory, weak back, insomnia, rheumatism, malaria, piles, lung, liver, stomach, bladder, and kidney troubles." "The Oxygenor is so simple, so perfect, and so complete, as to be a means of self-cure in the hands of every intelligent person." "This investigation was made without the knowledge of the Oxygenor Co."

I am exceedingly glad to get that government indorsement, and it has already been forwarded to Washington with the plea to have this thing dealt with as the postal authorities have dealt with Francis Truth.

Let me briefly answer Mr. Boothroyd, and everybody else who feels inclined to defend this senseless trap. No doubt our friend is honest—at least I hope he is—in telling what he has seen with his own eyes. I am glad to know that people got well; but judging from former experience I fear I shall fail in making him believe the senseless rigging had nothing to do with the recovery. The same remarks that I made in our issue for March 15, p. 230, about water-witching, will apply to this. It is not along in the line of scientific investigation at all, and would not stand honest scrutiny a single instant. There is no "oxygen" and no sense or science about it *anywhere*. In regard to the testimonials and wonderful cures, Francis Truth had the biggest testimonials of anybody. The greater part of them were

humbugs and frauds; but, sadder still, many of them were from people who imagined they had been cured. Oxydonor was an imitation of Electropoise, and this new Oxygenor is an imitation of the Oxydonor—fraud infringing on fraud. The principal reason why I publish this letter is because these things from the start made their capital by a shameful pretense of Christianity and godliness. The letter tells in detail how the Oxygenor not only saves the body, but they make a pretense to the effect that it *saved a soul*. The advertising has been done principally through religious papers, and ministers of the gospel have helped to push it, even recommending it to members of their own church. A man whose education is not sufficient to enable him to detect a bare-faced fraud like this should never be editor of *any* paper, and certainly not a minister in any parish. I have quoted again and again the decision of the United States Chemist, but they tell me the chemist is not up to the times. Why don't these fellows prosecute me for slander? They have threatened it many times. Because the proprietors know very well what the result would be if the humbug trap were taken before the courts. I hardly need assure our readers that the government never indorses any medicine or trap, much less a fraud like this; and the whole quoted sentence of the government indorsement is an ingeniously gotten up fraud and humbug. It is hard to believe that Mr. Boothroyd *himself* thinks it is genuine.

Just as I finished the last sentence the following hearty indorsement from our good friend Cook, of Claremont, Cal., was handed me. I wonder if the Electropoise folks will say Prof. Cook is not up with the times in new discoveries.

I was especially glad to read what you said on the "water-witch." I am surprised that any one should be humbugged by these water-witch men. Yet I find in Southern California not a few of our most intelligent men giving heed and often big money to these men of the willow wand. In Southern California there is a great reservoir of water under nearly all our valleys, and it does not take a very wise water-witch to predict rightly the presence of water. I myself have taken a stick a number of times, though without the least of faith, and in every case the wand refused to turn. We had a fine institute at Redlands last year. It was a farmers' club institute, and so we had delegates from all parts of Southern California. There was present in the audience one Jonathan Biggs, who was bold enough to assert that he could always tell of the presence of water and the depth required to reach it. He said he could even tell if the water was in a tub under the floor. During recess a tub of water was placed under the floor of the audience room. Mr. Biggs made an utter failure in trying to find it. One would naturally suppose that this would have been embarrassing, yet most men who deal in such matters know no embarrassment. So it was that Mr. Biggs, although receiving the ridicule of all present, was himself entirely unabashed.

I was especially glad to see your editorial on this matter, because there is an immense amount of this fraud being perpetrated upon our people, and a goodly number of our most intelligent citizens give it full credence, else how could we explain the "Christian Science" and faith-cure craze? We see the same incredulity suggested in the millions of dollars paid each year in advertising patent medicines. I think it is safe to say that the great majority of these nostrums are not only valueless but positively harmful. Dr. Oliver Wendell Holmes knew what he was talking about when he said, "If all the medicine of the world"—mind you he did not say *patent* medicine—"were thrown into the sea it would be a blessing to the people; but," he added humorously, "it would be awful on the fish."

Among the other good things that you have done as an editor has been your most commendable effort to expose these humbugs. When we notice that many of our cultured college-bred men are misled by such frauds, it certainly shows that the time is ripe for just such editorials as you are so frequently penning against these pernicious misrepresentations.

Claremont, Cal.

A. J. Cook.

The *Scientific American*, in a recent issue, while commenting on the fact that the directors of the Paris Exposition invite water-witches to come and make an exhibit, winds up with the following:

The whole business is akin to that of fortune-teller, the spiritualist, or any other charlatan, and it is strange that the exponents of such systems are allowed to pursue openly their avocations undisturbed by fear of prosecution. At present the victims are the only ones punished.

It is refreshing indeed to have such an authority as the above back me up in what I have been trying to teach.

DEATH OF J. W. WINDER, OF NEW ORLEANS.

The veteran readers of GLEANINGS will remember, without doubt, friend Winder. About the time father Langstroth got out his first honey-extractor, Gray & Winder made a revolving-frame extractor, which was mentioned on page 57. Mr. Winder was originally a photographer. He soon became an enthusiastic bee-keeper, attended all the conventions for years, was one of the first to rear queens and advertise them; and to the day of his death he made bees and honey his principal occupation. He died April 8, aged 71 years. I have mentioned Mr. Winder in my visits to New Orleans, and the courteous way in which he gave his entire time to piloting me around through the different portions of the city. He held his health remarkably. Even when nearly 70 years old he would walk a dozen miles a day, and almost without fatigue. We are informed by his son, A. T. Winder, of Alpine, Texas, that bronchitis was the cause of his death. One more of the old veterans has passed away.



MORE ABOUT GROWING AND SHIPPING GRAND RAPIDS LETTUCE; POTTING-EARTH, OR POTTING-SOIL.

The standard formula of the newspapers is leaf-mold mixed with various other things too numerous to mention—different mixtures for different plants. In practice, very few people get the leaf-mold. The various mixtures I think just as unnecessary for the ordinary flower and vegetable plants as are the many brands of fertilizers for different crops. They simply mystify and confuse amateurs; experts smile, perhaps audibly, at them, and each goes his own way.

Our practice, which we find to answer very well, is, one-third rotted sods, one-third rotted manure, one-third coarse sharp sand.

We usually plow as much headland as necessary, to give us what sod we need for the year, early in the summer, and pile them in alternate layers with fresh or rotted horse manure, whichever is handier. With us it usually is manure from mushroom-beds, of which we generally have a quantity, and which is highly prized by us for any fertilizing purposes. Watering the heap, if it gets too dry, and turning a couple of times, brings it to good condition by fall. It is then shoveled and pounded through a six-foot screen, one-inch mesh, and mixed with sharp lake or washed

sand, and carted to the potting-shed for use in winter, by which time it is further rotted, and is put through a half-inch sieve, swinging from the roof, which leaves it very nice, and uniform in texture. This earth, sterilized by steam, is very satisfactory.

The lath boxes, spoken of in GLEANINGS, page 186, are made 15 inches long, four laths on the bottom and two on each side (laths split in two are too light in our experience); end, half-inch pine, 5 in. long, 2½ wide or deep. This allows the sides to come about ¼-inch below the bottom, which gives drainage when watered in the water-bench.

This makes a very convenient box to handle with one hand, or six or eight of them can be carried on a tray. They are very nice, also, for plants for a re-ail trade, as a purchaser does not have to come for cabbage, onion, and celery plants, and again for tomato, and plants that must be set out later, but can take them home and keep them as well as we can until time to set them.

A good hand will dig his own seedling plants, and plant 150 boxes a day of lettuce, cabbage, and like

The boxes are made of ¾-inch spruce, ¾ inch ends, 30 inches long, outside; 15 inches wide outside; 9 inches deep inside measure, lined with paper 24x50 put in crosswise of the box, which leaves plenty to fold over the top of the lettuce when the box is full. Two other pieces, 14x20, line each end and fold over the same; another of the same size, with any advertisement or notice, is laid in ou top as well.

The cover has a cleat at each end, with nails driven through and bent, which hook on to cleats on the ends of the box, holding the cover on securely, yet it can be put on or removed in a moment. So many dishonest customers are using them to sell other lettuce and other goods out of as "Maplehurst grown," and, in fact, many goods that we do not grow at all, that, in self-defense, we have made arrangements to trademark all boxes and lining paper, which will, we hope, put a stop to the practice.

PACKING GRAND RAPIDS LETTUCE.

I suppose each man has his favorite way. Ours is as follows: One man brings the empties all lined,



INTERIOR OF GRAND RAPIDS LETTUCE-HOUSE, SHOWING PACKING-BOX, METHODS OF PACKING, ETC.

plants, spaced 32 to a box; celery, 55, would take longer; tomatoes, 12, would take less. For spacing-boards, see photo.

PREPARING AND PACKING FOR MARKET.

One of the best hits we have made is the package we were fortunate enough to get up several years ago, and which has proved entirely satisfactory. Barrels were used before we commenced using the box of which the accompanying view gives a very good idea, and were a constant source of annoyance. Grand Rapids lettuce will settle much more than head lettuce. The package was too large for many customers, and, when turned end over end by careless expressmen, the lettuce was much broken up and chafed against the side of the barrel, lowering the quality considerably. Barrels were never returned; boxes are supposed to be, and, in fact, do come back free of charge, on an average six times before they disappear.

The plain stenciling of the name of a grower, and contents of the box, on the neat package, is the best possible advertisement in the stores, markets, or on sidewalks, and, in fact, everywhere, when a considerable business is done.

ready; removes the boxes as filled; shuts down the covers, and addresses the boxes, which is done by fastening a card with the name of the consignee printed on it with rubber stamp; one tack through the middle fastens the card securely in a scarf about ¼ inch deep, made in the top of the cover at one end. This prevents the cards being knocked off when boxes are piled one on top of another, as would be the case if the card were nailed on the top of the box.

The packer sits on a low stool at the side of the box. One man on each side of him pulls the lettuce by catching the root between the thumb and first finger, palm of the hand upward; pulls it toward him; as he lifts it, disengages it from the rest of the lettuce; with a stick, a lath from an old plant-box usually, knocks the dirt from the roots, removes any wilted bottom-leaves, and hands it to the packer, who gives the roots a swish in a pail of water which he has between his feet, and places it in the box 8 in a row, roots lapping in the center, 3 layers making 4 dozen, which fills the box fairly in the winter, and with "scripture measure" in the spring.

Any plants considered by packers too small for firsts are dropped behind him and packed, eight dozen in a box, and labeled "culls." Culls usually are

snapped up at 20 cts. a box less than firsts by a certain class of trade. This gives the best trade, who seldom see any of the culls, an idea that you grow good stuff only, and stiffens prices a good deal.

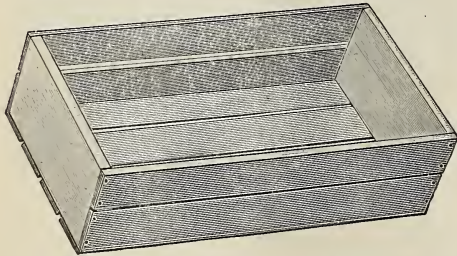
These directions may seem rather unnecessary; but if you have much *well-grown* Grand Rapids lettuce to pack in a hurry you will soon find out where they come in. Well-grown lettuce is very brittle, and must be handled as carefully as eggs.

We are not "lightning operators," like the Coggs-shall brothers, but our record is three minutes to a box for three hours. Four minutes is the regular thing, as careful sorting and handling are necessary, and one lives longer by not hurrying too much.

Waterloo, P. Q.

THOS. SLACK.

I am sure the above will be read with interest by thousands of gardeners and greenhouse men who do not grow Grand Rapids lettuce. In regard to potting-soil, I believe friend Slack is about right, and I think our largest greenhouse men have only one kind of potting-soil for all their work, or nearly all of it. Ours is chiefly jadoo, especially of late; but as there is quite a saving by mixing it with sand or ordinary potting-soil, we shall keep a supply on hand made as friend Slack directs. For seedlings, and filling the little boxes, I would have half or more jadoo, as it holds water so much better, and it is away ahead for growing any kind of seedlings, so far as my experience goes. You can afford to pay the extra price, I think, in order to grow our Grand Rapids lettuce seed in pure jadoo, or pretty nearly pure. I presume friend Slack has never tried it, as he does not mention it. The box he describes is longer and narrower than the one we use. I have had an engraving made of our own, so our readers can see just how it is put together. See the dimensions on page 186, March 1. Since using them I have concluded a shallower box would be better; and the suggestion of having the ends narrower so the lath goes down below the bottom is, I think, a very good one.



PLANT-BOX MADE OF LATH.

For our work in the greenhouse, the split laths are quite heavy enough; but as we always have a lot of remnants in our saw-room—enough to make all the boxes we need—we make them of that material. Basswood is stouter than the lath, even if made thinner. We find these boxes very convenient for handling thumb pots, and, in fact, potted plants of all sizes smaller than 3 inches. When the pots need water we dip the whole box in water. Where it is desirable to keep the water off from the foliage a lot of plants can be watered very quickly and very thoroughly. One of our boxes holds 12 two-inch pots; a larger number of thumb pots, but a smaller number of 2 or 3 inch pots.

Since the above article was sent us, friend Slack is inquiring for some extra select stock seed of Grand Rapids lettuce. He says he will pay a dollar an ounce (and I will do the same) for "pedigree" seed if that is the proper name for it. But before making a purchase I suggest that we have a sample, say a little pinch, to try in the greenhouse. A hundred seeds ought to tell if it is what we want. We can be making tests now; and when another winter comes we shall have some seed that is just right. If any of our readers have some seed they are willing to submit to the test, let us hear from them. If they have not, let some expert go to work and furnish it. Bro. Slack is proposing to grow his own seed, as he wants *the best* to start with.

GROWING VEGETABLE-PLANTS FOR SALE, ETC.

My experience during the winter with the forcing-bed has taught me some useful lessons. During the month of April, when we have cold winds and sometimes cold *drying* winds, we have had much trouble with our vegetable-plants before they were hardened off so as to stand both wind and sun. When a plant is first starting it should be surrounded by a damp *still* atmosphere of the proper temperature. The sash is all right to protect it from frost, and to allow the sun to warm up the soil and air underneath the sash. But an April sun, in the middle of the day, is too hot for any thing under glass. The books tell us to tilt the sash or move it part way off when it gets too hot inside; but this lets the sun pour down just the same, and dries out the air, so that the plants, especially newly transplanted ones, are sure to wilt. If you pull the sash off entirely when the wind is in the north you will lose more or less of them. Taking them up with some of the soil adhering to the roots, when transplanting, helps the matter. But we have a new plan that will grow plants without any roots at all, if need be. In fact, we make our hot-bed or cold-frame into a cutting-bed.

The plan is very simple. Have your bed tight, and have your sash tight and close just as soon as it begins to get too hot inside of the bed, instead of ventilating, cover the sash with cotton cloth. In order to prevent the wind from blowing off the cloth, have a pole fastened at both the north and south sides, like the plan for using cloth-covered frames in the tomato-book. Let the cloth be wide enough to lap clear over the sash on each side. For this purpose we want cotton sheeting made $2\frac{1}{4}$ yards wide, or what is called nine-fourths. The strip of cloth should be as long as your bed. We have them of different lengths. One is 50 feet long. When you have severe freezing nights, let the sheet rest over the glass as an additional protection from frost. As soon as the sun strikes the bed in the morning, roll up one of the poles so the sun may have a full chance on all the glass.

Whenever it gets so hot inside that the plants show a tendency to wilt, then *unroll* your cloth sheet, and the plants will have plenty of light but not too much heat. By three or four o'clock in the afternoon you can roll up the

sheet again. Follow this up without moving the sash at all until your plants are well rooted and stand up straight. Now give air gradually, but do not let them wilt, and do not let the wind "whip" them. When you have a still cloudy day, and the air is warm enough, take off both cloth and sash; and by all means give them the benefit of an April shower when a shower comes, and the weather is not too cold. By this method you save almost all the trouble of watering. If the plants are well watered when they are put in the bed they will have water enough until they are past the danger period. It really rejoices my heart to see hundreds and thousands of beautiful plants without a failure. As one can easily roll up a strip of sheeting 50 feet (or as much more as you choose, almost), the labor of handling the cloth is nothing compared with that of handling sashes. One man can attend to a large number of beds, without any assistance.

THAT LITTLE GREENHOUSE.

I can not take space to tell all about my new plants, but I must mention one or two. In looking over the list of cuttings of Mr. S. W. Pike (St. Charles, Ill.) I noticed he has pelargoniums, rooted cuttings, at 50 cents a dozen, or \$3.00 per 100. Now, I never saw a pelargonium until within the last few days, that I remember; but I ordered one-fourth dozen to see what they are like. While Frank was putting them in the little thumb pots I was talking with some ladies. Pretty soon he held up before me a little plant in a thumb pot, not more than two inches high, with two little blossoms on it; and these blossoms were to me about the most exquisite productions of the floral kingdom I ever saw. The plant looks something like a geranium; but the blossoms resemble a sweet pea, except that the pencillings and tints are more delicate and entrancing (I do not know any other word that tells it so well) than any other flower I know of. I carried it all around the neighborhood, and then as I was not yet ready to go back to the greenhouse I set it on my desk in the office. A good many busy cares oppressed me that day. Some things had to be hunted up and investigated. But again and again I would turn around suddenly and catch a glimpse of that little plant, and, oh what an uplift it gave me! It was like bright sunshine coming through the dark clouds. Then I would have the same story over again. I would get down into business, and forget all about the plant, and then my eye would strike it unexpectedly. If it could speak I imagine it would have said something like this: "Here I am, Mr. Root. God sent me to lighten your cares and to cheer you up. Oh! I am not a myth. I have been in this world longer than you have; and I have delighted hundreds and thousands of people, and, I hope, made them better men and women. I have been near you many times during your life, but you would not look at me, nor notice such a little bit of flower, until my Maker touched your heart; and now I am glad to have you notice me, and introduce me to your friends. Just give me a little of the right kind of care and I will show you yet greater wonders."

The pelargonium is, if I am correct, one of the geranium family; and then there are ever so many different pelargoniums. The one that delighted my heart so much is called the "Bride." I wrote to friend Pike right off, and ordered 25 more just like it. I told him to send them all with buds or blossoms on, and charge accordingly. By the way, we have several other varieties that are not yet in bloom. Perhaps some of them may be equal to the Bride; but as yet I can hardly believe it. If I could just carry this little plant around and show it to all of the readers of GLEANINGS who love flowers, it would be the most fun of any thing I know of in the world. The whole 25 plants are now in the greenhouse, and I think half of them are in bloom. One little plant that I have not had a week yet has on it seven beautiful blossoms and ever so many more buds. A friend told me they are such persistent bloomers that if the buds are not picked off they will blossom themselves to death. Now, there may be a prettier plant in the world than the pelargonium; but just now I feel as old Izaak Walton did when he said, "Doubtless God might have made a better berry than the strawberry, but doubtless he never did."

THE SOY BEAN; A SUBSTITUTE FOR CLOVER.

The Ohio Experiment Station has been for several years past making quite a few experiments on soy beans, even to the extent of several acres, and they just announce in a press bulletin, "As a crop to turn under for green manuring, we do not know its equal." Now, friends, this is an important matter to all those who are bringing up their soil by turning under green crops. Below we give the bulletin entire.

The soy (or soja) bean is an upright, stiff-stemmed, branching bean, introduced a few years ago from Japan, which is rapidly coming to the front as a most valuable forage-plant. It has been grown for several years by the Ohio Experiment Station with very satisfactory results. Planted on some of our poorest soils, it has produced two to three tons of excellent dry forage or hay per acre, which is eaten with relish by all kinds of stock. As a crop to turn under for green manuring we do not know its equal.

As the soy bean is a warm-weather plant it should not be planted before the last of May in Northern Ohio, nor before the middle in the southern part of the State. When planted for forage it is sown at the rate of a bushel and a half to the acre, on well-prepared land, sowing with the wheat-drill with all the runs open. Thus sown it soon covers the ground, and there is no trouble from weeds or foxtail. It should be harvested before frost, and cured as hay.

The soy bean, like clover, adds nitrogen to the soil, and it is therefore a renovating instead of an exhausting crop. It is especially suited to take the place of clover in a systematic rotation where the clover has been killed out by severe winters, as is the case at present over a large part of Ohio, or where the spring seeding of clover has failed to catch. The Ohio Experiment Station has used it in such cases with such good results that it feels justified in urging the farmers of the State to give it a careful trial.

There are several varieties of soy beans, some of which will mature seed in Ohio, while others will not. As a rule, the latter class are more valuable for forage, as they make larger growth. The beans, however, which are produced at the rate of ten to twenty bushels per acre, are a valuable feeding stuff, as they are quite high in protein, and to some extent take the place of such materials as lused meal in the ration. The Kansas Experiment Station has fed them to fattening hogs with the result of effecting a large saving in the quantity of food required to make a pound of

pork, and others report similar results in feeding them to sheep.

The Experiment Station has no seed of these beans for distribution, but it may be procured of most of the principal seedsmen.—*Press Bulletin No. 206 of the Ohio Agricultural Experiment Station. Wooster, Ohio, Apr. 16, 1900.*

DAMAGE TO WHEAT, ETC., BY FROST.

As we go to press, much complaint is made of wheat being killed by the heavy freezes in the fore part of this month. Somewhat to my surprise I find my own wheat almost unharmed. It stands as does our crimson clover, bright and green, and firmly rooted, and the only explanation I can give is that the underdrained ground, fertilized by plowing under green crops (with a heavy coating of manure years past, to help to get the ground into good condition) has enabled both wheat and clover to get so well rooted that even severe freezes at night, with hot sun during the day, do practically no injury.

CONTRIBUTION TO THE INDIA SUFFERERS.

Although I did not expect contributions for the starving people of India, as we go to press the following have sent in the money to me, to be forwarded as I think best:

L. R. Hillard, Canova, S. Dak., \$1.00.
G. R. Noren, Waverly, Ia., \$5.00.
Jos. Miller, Archibald, O., \$15.00.
J. R. Hillin, Salt Lake City, Utah, \$12.00.

Friend Hillin says with the above remittance, "It was collected among workmen."

Now, while I think it would get to our starving friends quicker by sending it to Frank H. Wiggin, 14 Beacon St., Boston, Mass. (the address I gave in our last issue), you can, any of you, send it to me if you wish. I will try to get it off within 24 hours.

Just as we go to press we find the following in the *Practical Farmer*:

Governor Stanley, of Kansas, has given his endorsement to Rev. Charles M. Sheldon's proposal to send a million bushels of Kansas corn to the starving people of India.

May God be praised for such men as Sheldon, and for such a governor to back him, and for such a State as Kansas. And why not? If they continue to keep out the saloons they can send off to their starving brethren a million bushels of corn, and do it easily. Yes, and here is something else about a single county in Kansas:

Governor Stanley, of Kansas, in speaking of the prosperity of that State, said recently that in Finley County there is but one pauper, yet the county has a p or farm which cost \$23,000, and is now maintained for the single inmate.

THE NATURAL-HEN INCUBATOR, ETC.

Mr. Root:—About the hen incubator you speak of, I have used the same thing, only larger, quite successfully for ten or more years. Where I could get no sisters only from nests where several laid, I could use them, and the biddy would proceed right to business.
Henrietta, Mich., Apr. 3. E. HOLLING.

We are very glad indeed, friend H., to know that the arrangement does certainly succeed, but you tell us it is an old idea. Perhaps Mr. Seims has, however, made some improvements that make it more practicable. If so, let him

give us a reasonable-sized book on the subject, instead of a single sheet of paper for the dollar, and GLEANINGS will give the book a big advertisement free of charge. By the way, our friends who have read the "New Egg-Farm" have perhaps noticed that Stoddard recommends a similar arrangement, only rather more complicated. Stoddard uses a natural hen, but he gives her abundant room and plenty of exercise. But Stoddard's *whole book* does not cost even a dollar, to the readers of GLEANINGS.

The *Practical Farmer*, of Philadelphia gives in its issue for Feb. 14 a drawing and description of the natural-hen incubator. Instead of asking each person to pay a dollar for the information, they give it to all their subscribers free of charge.

Special Notices by A. I. Root.

We are still sending samples of jadoo fiber free of charge. Just say on a postal, "Send me a sample of jadoo," and you will not need to write any more unless you wish to. If you put in some stamps for postage you will get more jadoo, that is all.

PLANT-BOXES, SUCH AS ARE FIGURED ON PAGE 320.

We can furnish these little boxes in the flat, ready to nail, nails included for \$2.00 per 100. The slats are made mostly of white basswood, which gives the box a very clean and pretty appearance, especially when new. Boxes nailed up will be 5 cents each, or 40 cents for 10.

SOJA OR SOY BEANS.

Perhaps I may mention that we have furnished our Ohio Experiment Station with most of the seed beans they have used—see page 321, and we can still furnish these at the following prices: Quart, 10 cts. (by mail, 15 cents extra); peck, 60 cts.; bushel, \$2.00. For two or more bushels shipped from Richmond, Va., we can make a special price of \$1.60 per bushel. The freight from Richmond to your place can be ascertained very nearly by your local freight agent. We can furnish a leaflet on application in regard to these beans.

SEWET POTATOES FOR PLANTING.

We can furnish Nansemon 1 or Jersey Yellow sweet potatoes, specially for growing plants, at 10 cts. per lb.; peck, 50 cts.; bushel, \$1.50; barrel, \$3.00. Also two varieties of the Vineless sweet potatoes, namely, bunch yam and General Grant. These latter will be a half more than the Jersey Yellow. If wanted by mail, add 8 cts. per lb. for postage. We mention this in order that the friends may, when ordering Irish potatoes, have a few sweet potatoes included with the shipment if they wish. The little book, "Forty Years with Sweet Potatoes," to every one who buys 50 cents' worth or more, or sent postpaid for 10 cents.

SEED POTATOES.

At present writing we have a supply of nearly every thing in our list, with the exception of Burpee's Extra Early. We were sold out on the Early Ohio, Triumph, and Bovee, but have found some excellent stock grown by a professional potato-seed grower in Michigan. In consequence of the cold March and April, at least up to the middle part of April, our potatoes have kept so far almost without sprouting, and we hope to have clean unsprouted seed clear up to the middle of June by opening up our cellar cool nights and closing it whenever it is warm, keeping out light during the middle of the day. As the cellar is lighted by electric lights we can do this quite readily. Our Sir Walter Raleighs at \$2.50 per barrel I should consider a bargain, even for table use; and we have quite a few seconds at only \$1.25 per barrel. Many of these are, in size and shape, firsts, but are put among the seconds because they are just a little scabby. These are certainly a bargain for table use; or if treated with corrosive sublimate they are probably just as good to plant as the firsts. Better send on your orders quick, if you want them. We still have a good supply,

also, of the Monroe Seedlings, seconds, at \$1.25 per barrel. The other *seconds* are all sold except Mills' Prize, Carman No. 1, and Manum's Enormous.

THE NEW RUSSET POTATO.

You will see by our new price list that the price of this new potato has been reduced from \$3.50 to \$2.50. They are worth this money for table use in most localities, as they are one of the best table potatoes I know of, and, so far as my experience goes, they come the nearest to being a scab-proof potato of any I have ever grown. The reduction in price is because we have a large stock on hand, and they do not seem to move off as rapidly as we had expected. They are all choice firsts, no seconds, and are, at the present writing, free from sprouting. Besides all the above, they are almost equal as a yielder to any potato I know of.

ANSWERING KIND LETTERS.

Dear friends, I am deeply grateful, and thank God ever so many times every day, for the exceedingly kind letters that are coming continually, and I greatly regret that it is utterly impossible for me to reply to each and every writer as I should like to do. My correspondence would prevent my getting into that little greenhouse at all if I should try to write even a brief personal letter to each one of you. And I regret, also, to tell you that it is entirely out of the question for me to undertake to send cuttings of my favorite plants, as I should like to do. Our two friends, Pike and Danley (see page 279, last issue), make a business of furnishing every thing at exceedingly low prices. They can send you cuttings by mail, of all plants I describe or mention.

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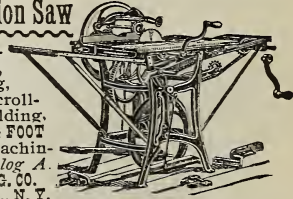
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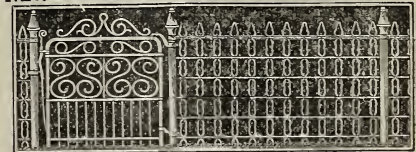
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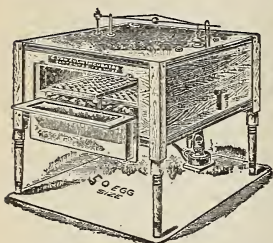
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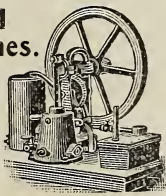
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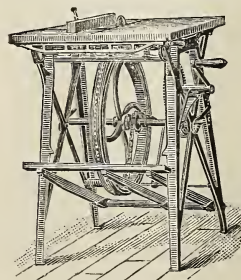


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